Pests

AND THEIR CONTROL

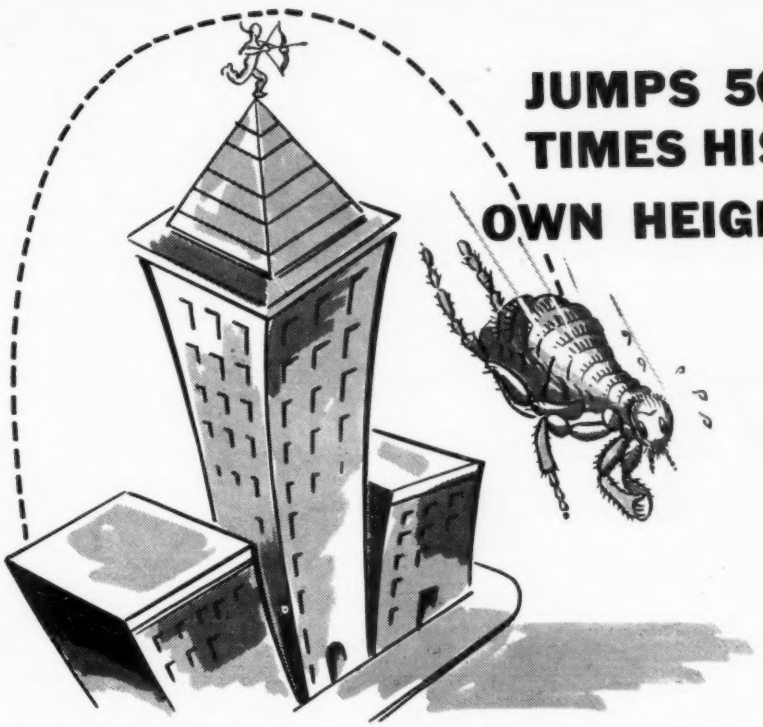
1941

FEBRUARY

VOL. 9 NO. 2

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.



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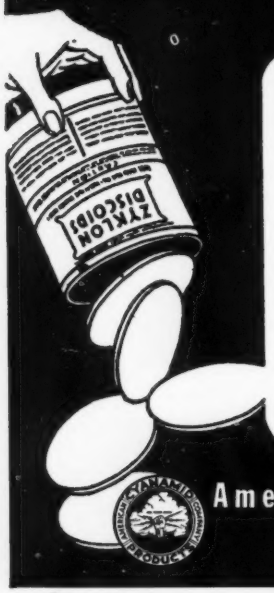

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STATEMENT

The National Association appreciates the co-operation given by way of publicity. The Association is not responsible for articles published unless credited to the Association. The list of officers and directors is published for informational purposes only.

For further details, communicate with
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3019 Fort Hamilton Parkway — **Brooklyn, New York**

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"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

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EDITORIAL

The Value of P.C.O. Conferences

THERE has come to our attention through the good offices of Prof. J. J. Davis, an editorial which appeared recently in the Orchardist issued by The Monroe Nursery of Monroe, Mich. The cogent reasons advanced therein for attending conferences seems to us so succinctly phrased, we are reprinting the germane parts of the editorial, retaining its essence but merely changing a word or a phrase here and there to tie it in closer with our industry.

"Sometimes some of us are inclined to question the value to P.C.O.'s of the various conferences and meetings which are held during the year throughout the country. These meetings are in large part the result of effort and study on the part of leading Government and University entomologists, N.P.C.A. officials and the more energetic P.C.O.'s.

The men who come to these meetings to deliver lectures and read papers on the various subjects of interest to P.C.O.'s have in the great majority of cases spent hours and days in the preparation of their material; and as they are men who by training and experience are qualified to discuss their subjects they can be listened to with profit by every P.C.O. The subjects are varied and cover a wide range. Also there is often the opportunity for the answering of specific questions which may have had some particular P.C.O. stumped.

Then there is the possibility of exchanging experiences with other P.C.O.'s and finding out what manner of means they have employed to overcome difficulties. Taking advantage of this situation is evidently the proper thing for the wide-awake P.C.O. to do.

Last and by no means least, in the reasons for attending your P. C. O. Conferences, is that this is an opportune time to compare your own ideas of administrative and legislative matters with your fellow P.C.O.'s. What the government is doing and intending to do with you and your business is mightily important to you. At your Conferences you have a chance to talk over many of these things with others whom you do not see in the every day course of your activities. It seems that it would be well to use this time to get even better acquainted with your fellow business men, but also to become better informed on the general state of your business and its various technical ramifications, including the latest governmental attitudes.

Your attendance at your Conference is pretty good insurance and the "rate" is low.

(This reminds us of the remaining conference of the present series—Pacific Coast Pest Control Operators Conference, University of California, Berkeley, Calif., February 20-21-22, 1941.)

Commercial Rat Control Service

PEOPLE are accustomed to the use of poisons to control insects and rodents. When confronted with a problem involving the removal of rats, the average property holder gives first thought to their destruction through the use of poisons. He wishes to remove the animals within a short time and he has learned that poisoned baits will give quick results. However, if he undertakes the task of preparing and distributing poisoned baits he will be fortunate if he completely removes the infestation with one bait application. In the majority of cases the initial treatment with poisoned baits, by persons who lack training and experience in rat control, fails to accomplish complete results. A few rats will likely remain and they will be wary of later attempts to remove them by the use of traps, poisons, and similar methods.

The trained pest control operator is able to perform an efficient service in solving rat problems. He is equipped with a specialized knowledge of control methods. He knows the food habits and the wily ways of rats, traits that are learned only through experience in working upon rat control problems under widely different conditions.

The danger in exposing toxic poisons is greatly minimized in trained, experienced hands. The capable pest control operator should know how and where poisoned baits should be placed to secure acceptance by rats without injury to human beings and domestic animals, and without contamination of food materials. With judicious care in the placement of baits, potent poisons can be used by skilled operators with a high degree of safety.

Red squill, a poison that is deadly to rats yet relatively harmless to human beings and domestic animals, has been used extensively by the general public for the past fifteen years. The development of red squill as a rat poison was due to the need of a lethal agent, specific to rats, that could be applied by persons inexperienced in the exposure of poisoned baits. Although red squill is practically specific to rats, it is far from being an ideal poison. If the initial treatment with red squill bait fails to remove all of the rats, the characteristic taste and odor acts as a warning to rats to avoid foods containing this material. When such a situation arises it is obvious that the rat expert must be in a position to use other poisons to accomplish his work in an efficient manner. Thus, in securing pest control service, the property holder must rely largely upon the experienced operator to apply measures that will produce the desired results.

The reliable pest control operator with experience in rat control, possesses a valuable fund of technical as well as practical knowledge about rats and rat control methods. The property holder may make use of this knowledge, looking toward permanent rat riddance.

Rats oftentimes gain entrance to buildings in spite of rat-proofing measures. However, over a period of time it pays to use concrete, wire mesh, sheet metal, and similar materials to close openings through which rats gain access to buildings. A rat control expert soon learns where rats enter a building and he may also determine the outside source of the infestation. He is able to furnish the property holder practical advice concerning sanitary as well as rat-proofing measures. Although the removal of rats through the use of poisons, traps, and similar methods is highly important, a valuable return from pest control will be realized by the property holder thru attention to advice that he may receive concerning measures that will have lasting value.

The great thing in this world is not so much where we stand as in what direction we are moving.—Oliver Wendell Holmes.

Fourth Pacific Coast Pest Control Operators' Conference

University of California, Berkeley, California
February 20, 21, 22, 1941

FOR the fourth successive year there is being held a conference to which all pest control operators on the west coast are cordially invited to attend. This conference is sponsored by the University of California with Professor William B. Herms, head of the Department of Entomology again serving as Conference Director. This will be a three day conference, the dates being February 20, 21, 22, 1941. The National Pest Control Association indorses this conference.

The following is a list of those who will participate in the conference program:

W. B. Herms, Professor of Parasitology; G. F. MacLeod, Entomologist in Experiment Station; S. B. Freeborn, Assistant Dean, College of Agriculture, Professor of Entomology; E. O. Essig, Professor Entomology; J. E. Eckert, Associate Professor of Entomology; W. M. Hoskins, Associate Professor of Entomology; H. N. Hansen, Associate Professor of Plant Pathology; M. A. Stewart Assistant Professor of Entomology; A. D. Borden, Associate Entomologist in Experiment Station; S. F. Bailey, Assistant Professor of Entomology; E. G. Linsley, Instructor in Entomology; R. L. Usinger, Instructor in Entomology; A. E. Michelbacher, Junior Entomologist in the Experiment Station; J. P. Fairbank, Specialist in Agricultural Extension (Agricultural Engineering); W. J. Norton, Business Manager, University of California, Berkeley; H. H. Benedict, Assistant Comptroller, University of California.

Laboratory Captains: Wm. Hogan, C. P. Cain, W. K. Davis, G. W. Peterson, R. E. Hackley, J. K. Hougham.

General Chairman, George A. Rader; Registrar, Ernest G. Mills; Secretary, Murielle Sea; Treasurer, R. V. Haneberg; Reception, V. H. Montgomery.

PROGRAM

Fourth Annual Pacific Coast Pest Control Operators' Conference
University of California at Berkeley
February 20-22, 1941

Wednesday, February 19, 1941

Registration at Hotel Durant, 6:00 P.M.-10:00 P.M.

Thursday, February 20, 1941

Registration at Hotel Durant, 8:00 A.M.-8:45 A.M.

Thursday, Agriculture Hall, Room 113

A.M.

9:00—Looking Ahead, W. B. Herms.
9:30—Greetings, S. B. Freeborn.
10:00—New Pest Control Literature, E. G. Linsley.
10:40—Recess.
10:50—New Findings in Pest Control, G. F. MacLeod.
11:50—Organization of Laboratory Sections.

Noon

Lunch, 12-1:30, Hotel Durant—W. J. Norton (Speaker), Public Relations.

Thursday, 1:30 P. M.

Laboratory Sections: 1. Entomological Technique; 2. Termites; 3. Ants; 4. Household and Dooryard Pests; 5. Stored Products Pests; 6. Insecticides.

Thursday, 3:00 P. M.

Laboratory Sections: 1. Termites; 2. Ants; 3. Household and Dooryard Pests; 4. Stored Products Pests; 5. Insecticides; 6. Entomological Technique.

Thursday, Agriculture Hall, Room 113

4:30 P.M.—Common Names of Insect Pests, E. O. Essig.

Thursday, Agriculture Hall, Room 113

7:30 P.M.—What's the Question? The Staff.

Friday, February 21, 1941, Agriculture Hall

A.M.

9:00—Dry Rot Fungi, H. N. Hansen.
9:50—Questions.
10:00—Newer Information on Termites, E. G. Linsley.
10:50—Questions.
11:00—Structural Corrections, J. P. Fairbanks.
11:50—Questions.
12:00—Convention Photograph.
Noon—Lunch.

Friday, Agriculture Hall, 1:30 P. M.

Laboratory Sections: 1. Ants; 2. Household and Dooryard Pests; 3. Stored Products Pests; 4. Insecticides; 5. Entomological Technique; 6. Termites.

3:00 P. M.

Laboratory Sections: 1. Household and Dooryard Pests; 2. Stored Products Pests; 3. Insecticides; 4. Entomological Technique; 5. Termites; 6. Ants.

Friday, Agriculture Hall, Room 113

4:30 P.M.—Insurance, H. H. Benedict.

Friday, Agriculture Hall, Room 113

7:30 P.M.—The Pest Control Operator and National Defense, W. B. Herms.
Open to the public.

Saturday, February 22, 1941, Agriculture Hall, Room 113

A.M.

9:00—Carpet Beetles, S. F. Bailey.
9:30—Questions.
9:40—Essentials of Successful Fumigation, A. E. Michelbacher.
10:20—Questions.
10:30—Earwigs, A. E. Michelbacher.
11:00—Questions.
11:10—The Pest Control Operator from the Property Owner's Viewpoint, Panel Discussion.
Noon—Lunch at Hotel Durant.

Saturday, Agriculture Hall, 1:30 P. M.

Laboratory Sections: 1. Stored Products Pests; 2. Insecticides; 3. Entomological Technique; 4. Termites; 5. Ants; 6. Household and Dooryard Pests.

3:00 P. M.

Laboratory Sections: 1. Insecticides; 2. Entomological Technique; 3. Termites; 4. Ants; 5. Household and Dooryard Pests; 6. Stored Products Pests.
4:45 P.M.—Moving Pictures.

Saturday, 6:30 P. M.

Annual Conference Banquet at the Berkeley Women's City Club (2315 Durant Avenue, Berkeley).

A Night in Paris.

PROGRAM OF LABORATORY SECTIONS

(Agriculture Hall, Berkeley)
1:30-4:35 P. M.

Section 1—Entomological Technique, Room 204: R. L. Usinger, T. F. Kelly, W. J. Perry, N. F. Hardman.

Section 2—Termites and Structural Pests, Room 203: E. G. Linsley, C. D. Michener, N. A. Olson.

Section 3—Ants, Room 307: J. E. Eckert, G. E. Bohart, F. W. Fisk.

Section 4—Household and Dooryard Pests, Room 109: M. E. Stewart, D. P. Furman, W. C. Reeves, B. Brookman.

Section 5—Stored Products Pests, Room 209: A. E. Michelbacher, N. Stahler, R. F. Smith, L. R. Jeppson.

Section 6—Insecticides, Room 8: W. M. Hoskins and A. D. Borden, J. W. Hansen, E. S. Loeffler.

Hotel Durant, Berkeley, California

Single Room (without bath)	$2.00
Single Room (with bath)	2.50
Double Room (without bath)	2.50
Double Room (with bath)	3.00
Twin beds (with bath)	4.00

Hotel Whitecotton, Berkeley

Single Room (without bath)	$1.50
Single Room (with bath)	2.00
Double Room (without bath)	2.50
Double Room (with bath)	3.00 up.

There are several other hotels in Berkeley where rooms are available at $1.00 and up. Anyone wishing to make hotel reservations

before arrival at the Conference may do so by writing to the conference secretary, Miss Murielle Sea, 1178 Oxford Street, Berkeley, California.

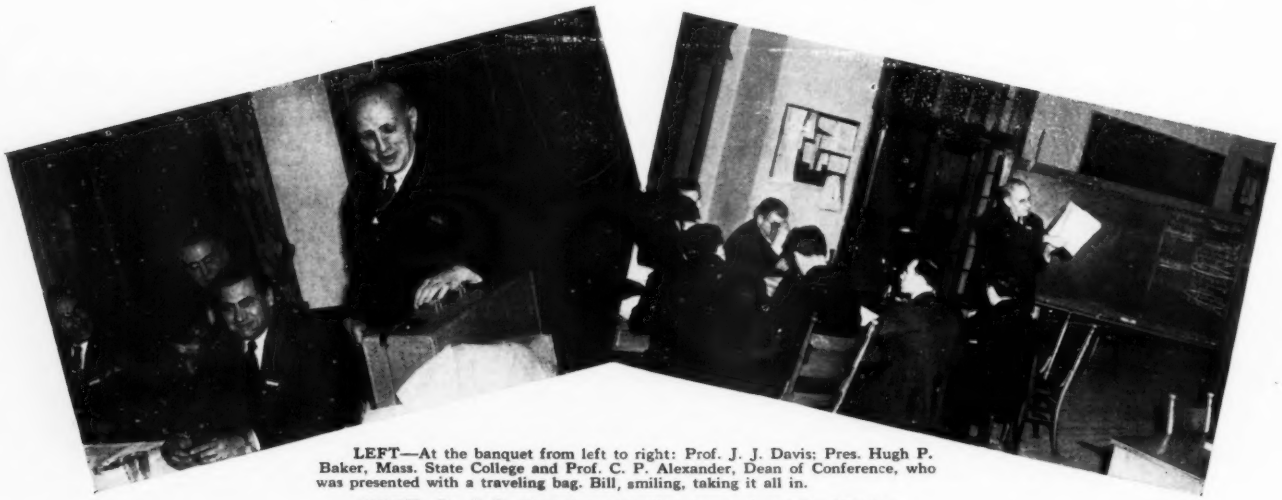
The registration fee of $6.00 includes cost of such items as specimen panels for mounting insects, pencils, paper, and outlines.

For use in the laboratory work we would like to have the operators bring along their forceps (pinchers or tongs to pick up the insects), a lens (if they have one), and about a half dozen insects for mounting on specimen panels. For those who do not have any specimens, we will provide them.

Arrangements will be made at the State Association Annual Meeting in San Francisco to register ahead of time for the Conference. At the Hotel Whitcomb (convention headquarters) someone will be in attendance throughout the entire day to handle the Conference registrations.

Registration for the Conference will also be handled at the Hotel Durant on February 19 between 6 and 10 p.m. Late registrants will be cared for at the Durant on the morning of February 20 between 7:30 and 8:45 a.m.

Snaps Taken at the Eastern P. C. O. Conference



LEFT—At the banquet from left to right: Prof. J. J. Davis; Pres. Hugh P. Baker, Mass. State College and Prof. C. P. Alexander, Dean of Conference, who was presented with a traveling bag. Bill, smiling, taking it all in.

RIGHT—Dr. C. P. Alexander conducting class in insect identification.

Three of the boys busy with identification.

Left to right: Roland Cook, Worcester, Mass. and Conrad Bohman of Rochester, N. Y., two students making certain a cockroach is not a bedbug.

In the foreground from left to right, Jim Van Sloat, Greenwich, Conn; Bill at microscope; Dr. E. A. Back, Washington, D. C.; W. E. McCauley, Urbana, Ill.

Bart Eldredge, Bill and Kenneth Harder.

Photographs furnished through the courtesy of Chas. Opitz.

Prof. J. J. Davis, Purdue University, Instructing group how to mount insects.

F. E. Garlough, Predator and Rodent Control Division, U. S. Wild Life Service, U. S. Dept. of Interior, Washington, D. C. "Rats and Mice" and explaining effectiveness of different formulae.

The First Eastern Conference Meets With Unusual Success

IT IS difficult to use enough superlatives in describing the outcome of the First Eastern Pest Control Operators' Conference which met at Massachusetts State College, Amherst, Mass., January 13-15.

This first conference was outstanding, first of all, by the large number of registrations, 101 to be exact, from 12 states. Secondly, it was outstanding because of the well arranged program, excellent facilities provided, fine scientific and practical presentations, and the intense interest displayed by all present.

The Conference was opened by Dr. C. P. Alexander, Head of the Entomology Department of M. S. C., who was Dean of the Conference—being ably assisted in the planning of the conference by Prof. A. I. Bourne, Research Professor of Entomology, M. S. C. The conferences were welcomed by Dr. Hugh P. Baker, President of Massachusetts State College. George R. Elliott, of Worcester, Mass., explained the pest problems of the eastern states, with special reference to the New England States. Wm. O. Buettner, representing the National Association, discussed the problems of the industry, stressing the increasing co-operation between the official entomologists and commercial operators. Dr. E. A. Back, of the U. S. Bureau of Entomology and Plant Quarantine, gave an illustrated talk on clothes moths and carpet beetles and the morning session was concluded with a discussion by J. J. Davis of Purdue University, on ticks as they relate to human and other animal diseases, and their control, with special reference to the brown dog tick which has become a serious problem in the northern states in recent years. It was interesting to note that one-third of those present have had to contend with this problem.

Monday afternoon provided an unusually profitable discussion of termite problems. Neely Turner, of the Connecticut Agricultural Experiment Station, gave a complete picture of the termite problem in the New England States, including procedures of control. This was followed by two excellent discussions dealing with construction and wood treatment as they apply to the prevention and control of termites. D. M. Muirhead, of Duxbury, Mass., with the use of illustrations clearly showed the effective-

First Eastern P. C. O.'s Conference at Massachusetts State College, Amherst, Mass. January 13-15, 1941

ness of various types of construction as they relate to termite prevention and George A. Garratt, of the Yale School of Forestry and co-author with Geo. M. Hunt of the well-known book, "Wood Preservation," gave a clear picture of the fundamentals of wood preservation and their practical application.

The Monday evening session included the showing of several moving pictures and the following five subjects by students at M. S. C.: "How Is Sodium Fluoride Killing the Roach?" by H. L. Sweetman (M. S. C. Professor of Entomology) and H. Laudani; "Damage by Clothes Moth Larvae to Silk, Rayons, and Nylons," by H. Laudani; "Methods of Testing Soil Poisons to Determine Their Effectiveness Against Termites," by F. W. Whittemore; "Biology of the Dermestid, **Trogoderma ornata** Say," by A. A. Pava; and "Toxicity of Insecticidal Dusts to Termites," by J. J. Prymak.

In order to give more individual attention, the Tuesday program was repeated, Section A, including half of the group, having a laboratory period in the morning and a series of talks in the afternoon, these being repeated in reverse order for Section B. The laboratory period was led by C. P. Alexander, assisted by John F. Hanson and Marion E. Smith, and consisted of fundamental information on the structure, development and classification of insects. Opportunity was provided for those participating to apply the fundamentals given to insect indentification.

The other half day period included the following topics: "Wood-Destroying Fungi," by M. A. McKenzie, M. S. C. Botany Department, "The Pest Thysanurans of New England and Their Control," by H. L. Sweetman and T. W. Johnson of the M. S. C. Department of Entomology, and "Powder Post Beetles," by W. B. Becker, M. S. C. Department of Entomology.

More than 100 persons attended the Conference Banquet held in Draper Hall Tuesday evening. J. J. Davis was toastmaster and Dr. F. J. Sievers, Director of the Massachusetts Agricultural Experiment Station, was the guest speaker, who spoke effectively on the need and value of cooperation and the importance of providing pest control service to the public. Others who spoke briefly included Dr. C. P. Alexander, Dean of the Conference, Conrad Bohman of Rochester, N. Y., Dr. Hugh P. Baker, President of M. S. C., and Wm. O. Buettner. Professor Alexander was presented with a beautiful traveling bag and Professor Bourne received a useful traveling set.

The Wednesday morning session dealt with the Chemistry of Insecticides and Their Application, led by Charles E. Palm, Head of the Entomology Department of Cornell University. The talks during this session included: "Importance of Chemistry in Pest Control" by T. R. Hansberry of Cornell University, "Fumigants" by George Chapman of the American Cyanimid Company, and "Synthetic Insecticides" by Bernard Barton of Rohm and Haas.

The Wednesday afternoon session was devoted to Rat and Mouse Control but there was injected a report by Kenneth Harder, Chairman of the Termite Committee of the National Pest Control Association, suggesting standards which should be adhered to by Eastern termite operators. These were adopted and approved unanimously. Mr. F. E. Garlough of the Fish and Wildlife Service discussed in a very enlightening way "Poison Methods and Permanent Rat Control Organization," and he was followed by George B. Lay of the same Service on "City Rat Campaign Procedure." A question and answer period followed, after which the Conference adjourned until 1942, with the assurance from the college authorities that they would be glad to cooperate with the N.P.C.A. in sponsoring a second conference a year hence.

"Termitekrieg! Termites Finally Win!"

The termites didn't actually cause the derrick to fall, but they carried on their fifth-column activities so successfully that it became necessary to fell the derrick.

Wind Affects Fumigation Results

Messrs. Cotton and Frankenfeld of the Kansas laboratory of the Bureau of Entomology report that in the recent fumigation of a brick flour mill and warehouse with methyl bromide during a period when the wind reached a velocity of 38 miles per hour, practically no kill of flour beetles was obtained in the warehouse, which was on the windward side of the building. Apparently the gas was all blown over into the mill, where the kill was satisfactory. The dosage of one pound of methyl bromide per 1,000 cubic feet had been found entirely adequate in the warehouse in previous tests when there was no wind. The desirability of delaying a fumigation until the wind has died down is evident.

Mosquito Offensive

Although one might be willing to swear it was the size of a good sized needle, the proboscis of the mosquito weighs only 0.0000006 of an ounce.

More On Derris As Possible Ant Repellent

ON PAGE 12 of the November, 1940, issue of PESTS, appeared a letter from Prof. J. E. Eckert, Associate Professor of Entomology, University of California, which related his experience in the use of derris powder as an Argentine ant repellent. At the time P.C.O.'s own findings were invited. We are now grateful to Robert (Bob) E. Hackley, of Palo Alto, Calif., N.P.C.A. West Coast Regional Vice-President, for taking time out to let us have his views on the use of derris as indicated. Quotations from his letter follow:

"Yes, some derris powders have a definite and valuable quality, which effectively repels ants for several days. I have mentioned this frequently and you will find it alluded to in 'High Lights of the Ant Clinic' in the August, 1939, issue of your magazine.

"However, those who wish to try this material should know that this repellent quality does not exist equally in all brands or types of the powder; some that I have tried have been quite lacking in this respect. The one that was most effective was very pungent and so irritating to the nose and throat that care was needed to avoid the unpleasant effect. It seems likely that the value of the powder lies in this irritating quality, and that by chemical study of the powder and its emanations the active substance can be isolated, identified, and perhaps eventually reproduced synthetically. If by experiment, it is found that the repellency of the powder is in proportion to the pungency, a starting point for investigation is established."

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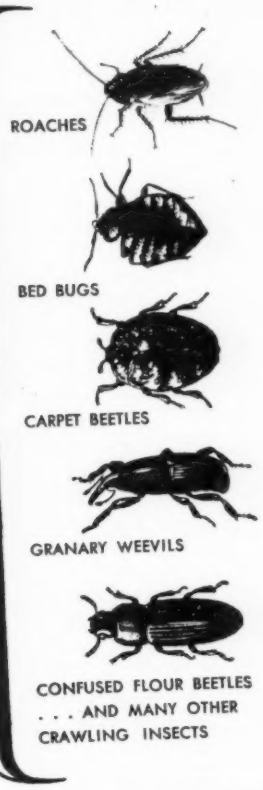

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Purdue Conference Huge Success

THE Fifth Annual Pest Control Operators' Conference, held at Purdue University, Lafayette, Indiana, January 6-10, was one of the most successful conferences since the initial conference in January, 1937. The registration totaled 93, not including Purdue staff members. This was fewer than 1940, due to the fact that many from the eastern states who had previously attended will attend the first conference to be held at Massachusetts State College the week following the conference at Purdue.

It is interesting to note that 12 were back for the fifth year, 15 for the fourth year, 19 for the third year, 23 for the second year, and 24 were in attendance for the first time. Sixteen states were represented.

The conference was opened at 9:30 Monday morning, January 6, by Prof. J. J. Davis, who introduced Dean Harry J. Reed, Dean of the School of Agriculture and Director of the Purdue Agricultural Experiment Station and Department of Agricultural Extension. The slogan which Dean Reed emphasized is one which every pest control operator might well keep before him constantly. It was *"There Is No Substitute For Results."*

The conference then divided into two groups, meeting separately until the evening session.

Group A included those who were attending the conference for the first time or those wishing to go further into the fundamental principles of insect life and insect control. Those providing the discussions on fundamentals included B. E. Montgomery, H. O. Deay, and J. J. Davis of Purdue University; Wm. O. Buettner of Brooklyn, New York, and V. R. Diamond of the Grasselli Chemical Company, Portland, Oregon.

Group B for the morning session visited two industrial plant jobs under the direction of C. O. Partlow of Lafayette, Indiana, and H. K. Steckel of Columbus, Ohio, and two termite jobs under the direction of Wm. O. Buettner. These inspection trips were thoroughly discussed at the Monday evening session, and the interest may be recognized by the fact that there was practically 100 per cent attendance. The principals participating included Kenneth Harder of Hempstead, New York, Charles Denny of St. Louis, Bob Yeager of Cincinnati, Bert Lewis of Muncie, Indiana, H. K. Steckel, Wm. O. Buettner, and others.

In the afternoon this group (B) met to discuss some rather unique problems. Perhaps the outstanding feature was the discussion by J. Lyell Clarke, Sanitary Engineer, In Charge, Des Plaines Valley Mosquito Abatement Project, Lyons, Illinois, on the control of mosquitoes in lawns and assembly grounds. Mr. Clarke expressed the thought that there is an increasing demand for mosquito control where lawn parties and assemblies are to be held and suggested this as a new and profitable field for the pest control operator. The control of chiggers and fleas in lawns was discussed by G. E. Lehker of Purdue and W. E. McCauley of the Illinois Natural History Survey. Ham and cheese mites were discussed by Robert C. Yeager and the brown dog tick and box-elder bug by J. J. Davis.

The Tuesday morning session included, first of all, a laboratory exercise on the preparation of wood block insect exhibit mounts, wherein opportunity was given for all to make up mounts of their own. This was followed by a demonstration on preparing advertising displays by Henry Turrie of Milwaukee and methods of maintaining live insect cultures by George E. Gould of Purdue.

The Tuesday afternoon session provided demonstration of diversified equipment and appliances for maximum efficiency in pest control. The demonstration topics included powder guns by T. C. Raley of St. Louis; flexible tube sprayers by C. Norman Dold of Chicago; electric sprayers by G. W. Breuer of Chicago; electric sprayers and dusters by H. G. Oren

Fifth Annual P. C. O.'s Conference at Purdue University, January 6-10, 1941

of Indianapolis; wood injection equipment by Bert Lewis of Muncie, Indiana; needle injection equipment by Charles Denny of St. Louis; types of nozzles and their part in efficiency by Geo. L. Hockenyos of Springfield, Illinois; gadgets used in termite control by J. R. Franklin of Hammond and B. C. Scherzinger of Cincinnati, and electric screens and their place in the field of household insect control by W. A. Pohlman of Chicago.

The Tuesday evening session included several reels of interesting movie films and a lively review of state and federal publications.

The Wednesday morning session was divided again into two groups. Group A had a full and profitable session on classification and identification of insects by H. O. Deay. Group B took as their general subject a more complete analysis of common household insects, including life cycles, habits, sources of infestation and controls, led by W. E. McCauley, Geo. E. Gould and Theodore Oser.

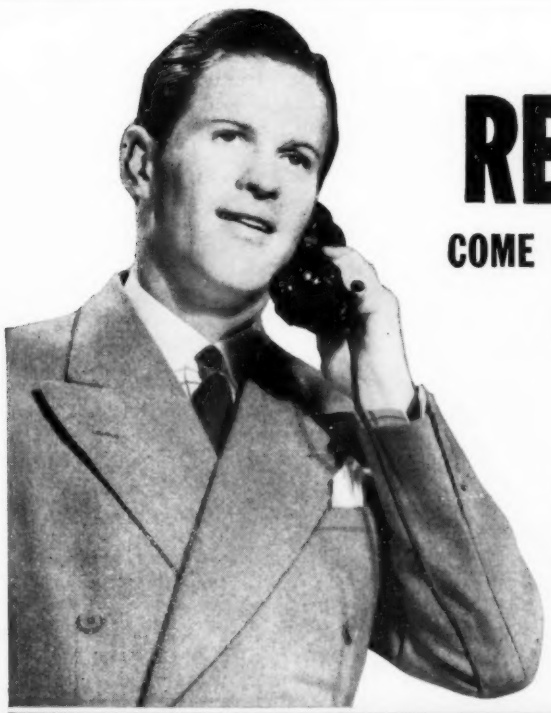
The Wednesday afternoon session was given over to powder post beetle and termite problems, the leaders of the discussions including H. K. Steckel, W. E. McCauley, Geo. L. Hockenyos, Ed Arnott and Kenneth Harder.

The evening session on Wednesday was especially interesting, Prof. J. H. McKee of Purdue giving the principal address on the subject of Fundamentals of Advertising. Professor McKee's words of humor and let us say "dry wit," along with his deep thoughts on the principles of advertising, will not be forgotten by those who heard him. Frank Schneller, Jr., of Milwaukee added some valuable thoughts on advertising, and especially as it applies to the industry as a whole.

The Thursday morning session dealt with the chemistry, preparation and use of insecticides. The leaders in the discussions of the various subjects included the following: An analysis of chemicals used by the pest control operator, Cady S. Corl of the Allaire-Woodward Company, Peoria, Illinois; The relation of application to efficiency, A. M. Akers, Cleveland, Ohio; Particle size in relation to effectiveness of liquid insecticides, E. M. Searls, University of Wisconsin, Madison, Wisconsin; and, Methods of testing insecticides against bedbugs and cockroaches, F. L. Campbell, Ohio State University, Columbus, Ohio.

The Thursday afternoon session was one of the most profitable of the entire conference. Both pest control operators and entomologists united in answering many questions submitted and in discussing other problems of mutual interest.

The highlight of the conference was the banquet on Thursday evening, held in the West Faculty Lounge of the Purdue Memorial Union and attended by 115 persons. Following the dinner the group was treated with musical numbers by students under the direction of Joseph M. Ragains, Assistant Choral Director and Director of the Purdue University Orchestra. Professor Davis introduced the toastmaster of the evening, Dr. Edward C. Elliott, President of Purdue University. President Elliott has become a most welcome fixture at the conference banquets. He has presided in this capacity each year since the initial conference banquet, excepting in 1939 when he was in the Philippines reorganizing the University of the Philippines. Short talks were made by Ward Combs of Omaha, as freshman of the conference; Wm. O. Buettner as the post graduate, and Prof. W. P. Flint of the University of Illinois. The guest speaker was Dr. F. B. Knight, Director of the Division of Education and Applied Psychology



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of Purdue University. His "five hints which will do no harm but might help" were valuable and impressive thoughts. On behalf of the conference members, Mr. Buettner presented to President Elliott a "bottle" of bills, totaling $100.00, as an addition to the P.C.O. Student Loan Fund.

The Friday morning program, concluding the conference, was one of the most valuable of all the sessions. The first part dealt with rats and mice. G. C. Oderkirk and B. P. Kolkana of the Fish and Wildlife Service of the U. S. Department of the Interior gave very informative demonstrations of practical tests of poison baits, and Martin Meyer of Philadelphia discussed a study of the acceptance of food by rats which he has been conducting. These topics were followed by a discussion of poisoned bait methods, with special reference to formulae for rat and mouse control, led by G. C. Oderkirk. The second half of the morning session concerned safety measures in connection with fumigation problems. The fumigator's kit and how to use the items contained therein was ably discussed by Herman C. Militzer of Toledo and J. H. Sturgeon of Louisville. Max Rukin demonstrated the use of gas masks and respirators. In the discussion, gas masks were generally recognized as essential for all hydrocyanic acid gas fumigations; however, respirators have not been so commonly used by those applying dusts, although good evidence was given to show the desirability of using respirators when applying dusts, especially fluorine compounds, as a health safeguard.

An insect identification "contest" was participated in by many present. C. O. Partlow of Lafayette was high man with a grade of 96 and Bob Adams of Cincinnati second with a grade of 92.

One of the new and interesting features of the conference was a room full of exhibits, including live and mounted insects, equipment, advertising matter, etc.

The Conference slogan read *"Another Year—A Better Industry,"* and from the trends observed this slogan will be kept in fact and in spirit.

Crickets Still Fight

Despite the invasion of Japan, Chinese continue to throng to cricket fights and to wager large sums on their favorites. Men who train crickets to win battles are receiving large sums for the insects. One Chinaman admitted in a Hong Kong court some time ago that he had murdered an old friend merely to get his champion cricket.

A New or Unemphasized Field for the Pest Control Operator – Mosquito Control on Lawns and Assembly Grounds

By **J. LYELL CLARKE**, *Sanitary Engineer, The Des Plaines Valley Mosquito Abatement District, Lyons, Illinois*

EDITOR'S NOTE: *A paper read before the Fifth Annual P.C.O. Conference at Purdue University, January 6, 1941.*

I RECEIVE, perhaps, an average of ten calls during each mosquito breeding season, stating the question that is uppermost in the female mind, "I am giving a lawn party. Mosquitoes are awful. Isn't there something I can do to get rid of them—even for several hours?" These calls come usually about fifteen or twenty days after a hard summer rainfall of three inches or more. Within this 15-day period millions of eggs hatch in shallow pools, larvae grow, pupal shells burst, mosquitoes take wing, swarm over marshes, mate, disperse with the winds and are ready for their first blood meals. So, I say, "No; there isn't a thing you can do. The mosquitoes present now have emerged from large marshes perhaps fifteen miles away, and have flown into the suburban villages. Within several years, perhaps, we will extend drainage operation to these outlying marshes and gain control of broods of mosquitoes such as are pestering us now." And so goes my explanation. I dare not tell them what to do, because I know they aren't equipped to do it; and if I attempted to do it with the equipment and materials of the District, I would get so many calls to spray lawns that we would have to neglect our routine work of eliminating mosquito breeding marshes, and the spraying of mosquito larvae in flood pools. I would be spraying mosquitoes on the wing where they exist at the rate of two thousand per acre in the grasses and shrubbery instead of ten to one hundred million per acre in the shallow receding pools. But, there is no reason why you, as a pest control operator, could not satisfy these complaints. It is beyond the compass of a pest control operator to control mosquitoes at the source of breeding, but not at the point of annoyance. This is definitely your function. There are calls from Legion affairs, beer gardens, June weddings, musical concerts, even loading platforms on railroad and express companies' depots. There is definitely a demand for service which is clamoring to be satisfied.

With this picture of individuals, small business firms, and large corporations who are frantically calling for relief—even partial and temporary relief—from mosquito annoyance, let us turn our attention for a few minutes to the mosquitoes that are causing all this trouble, and try to understand their point of view. Where do they come from and how do they act?

We may discuss their breeding and biting habits briefly in the order of their arrival each season.

1—The early spring group of five or six species are all woodland mosquitoes. **Aedes stimulans** is typical of this group. They breed in shallow woodland pools. They emerge as winged insects the latter part of May. They remain in the wooded areas. However, if dwellings are in a wooded area, such as is the case in many highly restricted real estate developments, it is almost impossible during a wet spring to start to plant and tend a flower garden. There is need for your services here in wooded areas.

2—The second group comes in June in appreciable numbers, but usually in July after a week of rainy weather. In fact, the floodwater mosquitoes may appear in tremendous hordes blanketing an area of twenty or thirty miles square as the result of heavy rains which cause flooded bottom lands, prairie pools and wet lots in villages. There are fifteen or more species, but one long flying species, **Aedes vexans**, constitutes 90% of all present. This is the species that will bring you business. It comes so unexpectedly overnight that it makes life on the lawn unbearable. It makes the golfer at the driving range throw down his club and leave in disgust. This mosquito will pile up so many

hurried calls for you that you will have to work overtime routing your spraying trucks hither and thither, that is, if you would but let the public know that you can disperse the stinging horde from assembly grounds for even a period of three hours.

3—The third group comes in August. The most common of this group is the **Culex pipiens,** which breeds in polluted water, and unlike woodland and floodwater groups, this group is house-entering. Unlike the other groups that bite in the day, the polluted water mosquito bites at dusk and in the house at night. The house-entering polluted-water mosquitoes will not reward you with service calls, for usually in the absence of a mosquito abatement district to call upon for elimination of the source of breeding, the householder usually purchases a can of mosquito repellent at the drug store. However, within a radius of one mile of a large dump or body of polluted water, you will be called upon to service lawn parties, riding stables, etc.

There are several other mosquitoes which cannot be included in the above groups. that may bring business your way. The **Mansonia perturbans,** a literal scourge, occurs in the Calumet Lake region. It appears the last week in July and persists for a month. Several species of the malaria transmitting group are present in the Chicago area, but are of little consequence as a pest because they sing softly and bite gently.

With general knowledge of the three groups: the Spring group of woodland mosquitoes; the Summer group of floodwater mosquitoes and the Autumn group of domestic mosquitoes, and the high points as to the nature of annoyance characteristics of each group, we may consider a method of control on lawns and outdoor gatherings, and then hope for a cheaper and better method which will most certainly evolve from experience and observation of this rather costly method to be described.

I might say in passing that service calls in early spring, caused by the woodland mosquitoes, would most likely reach your office through members of garden clubs if timely literature were placed in their hands. Service calls to subdue the floodwater group would come in June to October, twenty days after hard summer rains. Large-space broadside advertisements in a daily newspaper timed to meet the peak of annoyance would bring results. Service calls to control the stealthy night-after-night agony of the polluted water mosquito would be expected in August and September and might be solicited within a one-mile radius of large bodies of polluted water such as is caused by a garbage dump or sewage pollution of a stream or river.

It is particularly fortunate that mosquito annoyance from all groups will respond to the same method of treatment. This treatment was suggested by Dr. L. L. Williams, Jr., Senior Surgeon, U. S. Public Health Service, as a result of an experiment at the Yorktown Centennial Exposition in 1932. In order to protect a gathering of 15,000 persons he sprayed 230 gallons of the concentrated extract of pyrethrum upon a ten-acre marsh to control salt marsh mosquitoes that had recently emerged.

Heretofore, mind you, it has been common practice to use pyrethrum sprays indoors but here Dr. Williams was going a step further in attempting to kill them outdoors. Using a power sprayer, he attempted to kill the insects on the wing. I like the way Dr. Williams describes this experiment. He says, "It made a mist which would travel with the breeze very nicely. While this was going on we actually saw rather large num-

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bers of **sollicitans** fall out of the air. You are all familiar with how they collect around you in a marsh when you walk through the marsh. Those of us who were down the breeze, to see if we could still get the smell of kerosene, noticed that the mosquitoes that were roosting upon us were dropping off rather rapidly and those that were buzzing around were taking 'nose dives'. We searched for a number of these mosquitoes and found them in the grass. We kept them under observation for a while to see if they would come back to life, but they did not. Occasionally some would make convulsive movements, but for the most part they seemed to be dead." At this point Dr. Ginsburg entered the discussion excitedly: "This is a very interesting experiment. It opens a new field and I am glad that Dr. Williams brought it out. We have been looking for repellents for a long time. Here is a good substitute. In other words you might go out in the marsh and, instead of covering yourself with a repellent, carry a sprayer and squirt the spray around and kill the mosquitoes." Ginsburg the following year applied his newly derived formula of pyrethrum larvicide to similar outdoor gatherings with marked success. Since that time many experiments have been carried out by mosquito abatement districts, and in some municipalities that possess high pressure shade-tree spraying equipment which is essential to a successful demonstration.

I may describe this method without attempting to review a long list of trial demonstrations. These are on record and may be referred to at your leisure. Let us choose a lawn 50x50 feet to be protected from mosquito annoyance for a period of three hours. In order to keep this area free of mosquitoes it is necessary to kill or sicken all mosquitoes within this area and one hundred feet beyond, making a total area to be sprayed of 250x250 feet, or approximately 1½ acres. The material is sprayed at the rate of 50 gallons per acre. The treatment of a small lawn such as described requires 75 gallons of the diluted spray material.

In order to prepare this material, five gallons of 40% cocoanut oil soap and 50 gallons of water is passed through a rotary pump for a period of fifteen minutes until it forms a well-mixed suds, then 100 gallons of kerosene and five gallons of pyrethrum 20:1 concentrate is poured slowly into the suds until it forms an emulsion. This emulsion was prepared by Ginsburg in 1930 and since has been put on the market in an improved form, known as "Mosquito Larvicide Base." This material is sprayed into shrubbery, on grass, weeds, flowers and into trees. The application should be made not more than one hour before the people assemble on the lawn. The material is sprayed with a twenty or thirty-five gallon-per-minute pump at a pressure of 400 to 600 pounds, as is customarily used in spraying shade trees. Particular effort should be made to throw the material high into the air, causing a drifting fog. The rate of application is 50 gallons of the dilute spray per acre; however, rates as high as 200 gallons per acre have not caused injury to foliage. I might add here that midges and flies disappear as well as mosquitoes.

The larvicide costs 23c per gallon in the stock solution, or 2.3c when diluted with ten parts water to one part of the stock emulsion.

The cost of spraying a lawn is estimated as follows:

75 gallons diluted spray material @ 2.3c	$ 1.73
Spraying time—one-half hour for a crew of three men to spray and handle 200 feet of hose	1.75
Running time — two hours to and from job and filling	7.00
Cost of inspection trip to obtain permission to spray adjoining lawns (a precautionary measure)	3.00
	$13.48

This is a minimum cost without considering the investment in a sprayer of $1,500; a truck at $1,200, overhead, administrative cost, and advertising. Yes, it can be done; but the cost of protecting a lawn by this method would seem to be prohibitive. A new method is needed—one that would require only one man, a light truck, small light equipment, a material that would not leave a damp fog, that would not require obtaining permission of adjoining neighbors to spray their property as a protection zone. There should be a better method, an unobtrusive method free of engine noise and long lines of hose. A method that would permit of a service charge of $5 or $10.

I fear that you are leaving a fertile field untouched. Our newspaper editor in Riverside estimates that in this town of 6,000 there is an average of one garden party each week. A city of 50,000 population would have upward of 100 garden parties during a summer. There are 188 cities of 50,000 or more. If only 10% of the garden parties required your service it would bring in gross receipts of $18,000. Yet, the garden party is the least of many avenues of profit. Would you dare estimate that you are losing a half-million each year in this new field—control of mosquitoes-on-the-wing!

What are roaches worth to you?

What is your revenue from rats, from bedbugs, from termites, from fleas?

How do these known revenues compare with the unknown revenue to be gleaned from control of mosquitoes-on-the-wing?

Technical Comments

The material presented below represents excerpts covering conclusions ascertained from certain research on THALLIUM and RED SQUILL discussed in two articles in the Journal of the American Pharmaceutical Association. These digests will preserve the essence of the research in question for our readers.

THALLIUM. XIII. SYMPTOMS AND SYSTEMATIC ACTION ON CATTLE

Justus C. Ward

1. Thallium - sulphate - poisoned steam - rolled oats may be taken in lethal quantities by cattle when this bait is fed after a 24 hour period of fasting.

2. The minimum lethal dose for cattle is approximately 25 mg. of T1/Kg. of body weight.

3. There is no consistent effect on temperature or pulse, but respiration is depressed.

4. A 25-mg./Kg. lethal dose would imply that an 800-pound cow would have to eat 2 pounds 8 ounces of bait containing 8 mg. T1/Gm. to kill. Normal infestation of ground squirrels or prairie dogs requires less than one pound of bait to the acre. This means the cow would have to pick up all the exposed grain from more than two acres to get a killing dose.

Considering the fact that the rodents accept thallium-poisoned bait quite readily, and as a consequence remove a large percentage of the bait from the surface of the ground, it would seem a very remote possibility that cattle would be accidentally poisoned on areas where the thallium-poisoned grain had been properly exposed for rodent control.

RED SQUILL V. THE SUSCEPTIBILITY OF HOGS TO RED SQUILL

By Justus C. Ward, Clifford W. Barber, F. E. Garlough, James C. Munch

1. Red Squill powder is lethal to hogs when given by stomach tube in doses of 175 mg./Kg. and above.

2. Red Squill extract is lethal to hogs when given by stomach in doses of 500 mg./Kg.

3. Most hogs will not eat enough red squill rat poison voluntarily to cause death.

4. Red Squill powder causes emesis in hogs, which tends to protect the animals when baits are consumed normally.

Poisons and Their Application in the Control of Rats and Mice

By F. E. GARLOUGH

EDITOR'S NOTE: *Presented by F. E. Garlough at the Annual Convention of the National Pest Control Association, October 28-30, 1940, at Indianapolis, Indiana.*

THE warfare that rats and mice have been waging on the human race since A.D. 1200, seems, at times, to have the poor human beings backed up against a wall. The humans think that the rats do not know when they are defeated, for if they are knocked down one day, they are back the next for more persecution. They are like the ground squirrels on a certain ranch in California belonging to an absentee landowner who lived in one of the Eastern states. The county rodent control division poisoned his ground squirrels for him each year and sent him the bill. After the fifth year he protested vehemently and wrote back as follows: "I have killed them squirrels five times already and refuse to pay for it again." So it is with rats. They are splendid for keeping a job going but discouraging to the operator who wishes to finish a piece of work. No doubt many of you, at times, are in the same frame of mind as the absentee landowner and are tired of killing the same rats five times. The cause of such a situation may be that:

1. The source of supply was not found and cut off.

2. The areas treated are too small and are surrounded by rat-infested places, from which reinfestation occurs.

3. The first control treatment was not sufficiently effective and there was no follow-up system of control employed.

4. The control operations were planned as a one-season campaign and not as a continuous and permanent operational project until the last rat should be removed.

To make rat control really effective it is necessary to set up an organization that is capable of continuous control operations on a sufficiently large scale to prevent rapid reinfestation by breeding and by migration.

The fundamental principles underlying rodent control are essentially the same for rats as for ground squirrel operations. In California during the years 1917 to 1920, extensive campaigns known as "Rodent Control Week," "Ground Squirrel Day," or some similar term were conducted. These had excellent educational value and were well worthwhile at the time, but for various obvious reasons they did not effect desired ground squirrel control. The relief from squirrel depredations was only temporary. Too

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many ranches remained untreated, and the results obtained in many places were not satisfactory; consequently, a quick return of ground squirrels took place. This situation has been largely corrected by a permanent-control system of operations in the various counties. It is hoped that a similar plan of permanent control can be devised for suppressing rats and mice in cities and small towns and on farms. In the execution of such a plan commercial operators could be of great assistance.

Natural methods used in controlling rats include rat-proofing buildings; removing rat harbors; keeping food as strictly as possible out of reach of the rats; and keeping garbage and other refuse at city dumps, at restaurants, and at all other buildings completely covered. All cities of any size should have sanitary fill systems for the disposal of refuse, or incinerators, or both.

Artificial methods of control are trapping, fumigating, and poisoning. If both the natural and the artificial methods are properly used and their application well organized the rats can be effectively controlled. The problem is how to accomplish this with limited funds and personnel. The fundamental principle of rodent control is to select methods that will prove efficient in overcoming the ability of the rodents to reproduce and to migrate—the two bulwarks of rodent defense against which control operations crash and often fail.

The method of control here discussed is the use of poison baits and their application. The accompanying chart gives the specifications of the poisons and the recommended quantities to use in the preparation of bait.

Arsenic Trioxide. This is the compound of arsenic generally used. It is advisable to buy the U.S.P. grade of 100 mesh or finer, though there is a technical grade containing about 1 per cent more impurities. The lethal dose is 100 mgs./kg for a 90 per cent efficiency (LD-90). With this dosage death usually occurs within 24 hours. Some rats may have a greater resistance, and in such cases a longer time may be required.

Poison eaten by an animal has both a direct and remote action. It acts first directly on certain organs, and these in turn act upon others. Arsenic acts on the muscular tissues of the walls of the capillaries, causing them to relax and dilate; this results in a fall in blood pressure as resistance to the flow of blood is lowered. This action continues until paralysis of the capillaries occurs. The paralysis causes an exudation into the connective tissue underlying the epithelium of the digestive tract which raises it similar to a blister on the skin and causes the epithelium to slough off—a characteristic sign of arsenic poisoning. The general spread of this condition in extent and severity brings on a collapse of the system, and death results through exhaustion. The time that elapses from the ingestion of the poison until death occurs depends on the quantity taken and the rate of absorption, which may be very rapid at times and again very slow.

Among individual mammals there is a rather wide range of susceptibility to arsenic. An immunity to this poison can be built up by starting with small doses. Arsenic is toxic to all animals that have a central nervous system, so strict care must be taken in its use.

In case of accidental poisoning, the first step always is to call a physician. The suggested antidotal treatments that are to follow for the different poisons are not always successful in saving the life of either human beings or animals. They are intended as first aid until a physician's care can be obtained.

The treatment now recommended for acute arsenic poisoning is: If the patient has taken the poison within the previous 24 hours, give 1 teaspoonful of mustard in a cup of warm water; after vomiting has ceased, give the whites of two eggs or one tablespoonful of egg albumen powder in a glass of warm milk. If the poison has been in the system longer than 24 hours, the emetic may be omitted.

In the preparation of bait for use in rat control the recommended proportion of the usual commercial form of arsenic is 1.5 to 3 per cent, or 1 lb. of arsenic to 33-1/3 lbs. of bait material. If a very fine micronized powder is used, the quantity may be reduced to 1.5 per cent in order to obtain a 90 per cent or better efficiency.

The solubility of arsenic trioxide in cold water is very slight; in hot water, it is 1 oz. in 425 cc, or about 1 pt. It is freely soluble in glycerine.

Sodium Arsenite. This is the form of arsenic generally used when a solution of it is desired. It is obtained in powdered form and has a toxicity of 130 mgs./kg on rats. Its action on animals is about the same as that of arsenic trioxide. Sodium arsenite is very soluble in cold water, and if one ounce of it is dissolved in one gallon of cold water, the lethal dose for a 250-gram rat is 4 cc of the solution.

Barium Carbonate. The powdered form of the technical grade of this compound is the one generally used

Table 1—Solubility and Toxicity of Poisons for Rat Control and the Proportions to Use With Bait Material.

Kind	Form	Liquid required to dissolve 1 ounce		Lethal dose		Proportions for 90 percent efficiency	
		Cold water	Other	Mgs/Kg (1/)	Killing Time	Poison	Bait
					Hours	Ounces	Pounds
Arsenic trioxide	U.S.P., 200 mesh	2/3 qts.	. . . . .	100	24	16	33-1/3
Sodium arsenite	Commercial powder	(3/)	. . . . . (3/ Dilute)	130	24	1	4/ 8
Barium carbonate	Technical powder	(5/)	(ammonium chloride)	750	24	16	4
Red squill	Commercial powder	(6/)	. . . . .	400-600	24-120	16	9
Do	. . . . Do . . .	(6/)	. . . . .	600-800	24-120	16	7
Strychnine alkaloid	. . . . Do . . .	48 gal.	(Alcohol 4½ qts.) or (chloroform (1/3 Pt.)	10	1/2	1	10
Thallium sulphate	. . . . Do . . .	7/567 cc.	. . . . .	25	72	1	8/ 4
Zinc phosphide	Commercial powder (fine)	(6/)	. . . . .	25	6	1	9/ 6

1/ Milligrams per kilogram of body weight.

2/ Arsenic trioxide in hot water, 1 pt.

3/ Very soluble.

4/ Approximate weight; use 1 gallon of water.

5/ Only slightly soluble.

6/ Insoluble

7/ Thallium sulphate in hot water, 156 cc.

8/ For mouse control, 6 pounds.

9/ For mouse control, 10 pounds.

in rat control. The lethal dose for rats is 750 mgs./kg, and the rat usually dies within 24 hours. The toxic action of this poison on the animal is quite different from that of arsenic. Barium carbonate stimulates most of the muscles of the heart, arteries, and intestines, thereby producing powerful heart action and strong constriction of the blood vessels, and increasing greatly the peristaltic movements of the intestines. There is finally an excessive stimulation of the central nervous system, which brings on paralysis and death.

Barium carbonate is very slightly soluble in water, but dissolves freely in a dilute solution of ammonium chloride.

This chemical is used in rat bait in a 20 per cent concentration, or in the proportion of 1 pound of poison to four pounds of bait material. Rats will take this poison more readily in wet baits than in dry. The baits must be taken within 24 hours after exposure or they become sour and then will not be eaten. The results obtained with barium carbonate are only fair, but this chemical is cheap and may be used on city dumps where a bait for one night is desired.

For accidental poisoning with barium carbonate first administer an emetic—1 teaspoonful of mustard in a cup of warm water. After vomiting has ceased give 1 tablespoonful of epsom salts in a glass of water. For accidental poisoning of animals, sodium sulphate may be used in place of epsom salts, or magnesium sulphate, if so desired. The purpose of it is to convert the barium into the insoluble barium sulphate.

Red Squill. This poison can be purchased both in powdered and in liquid form. The commercial product in the powder form now on the market varies in toxicity from 600 mgs./kg to 1,500 mgs./kg at higher altitudes. At sea level the same powders have a toxicity of 1,000 mgs./kg to 2,500 mgs./kg. The length of time before death ensues varies from 24 to 120 hours, and may occasionally reach 168 hours.

Red squill depresses the muscular activity of the body, and so produces a slower pulse rate, labored breathing, and a rise in temperature. It stimulates the nervous system, causing paralysis of the hind limbs, convulsions, and peculiar gyrations. Finally it depresses breathing so excessively that the animal dies of respiratory failure.

Red squill powder is insoluble in water and hence has to be used in a solid form. If it has a toxicity of 400 to 600 mgs./kg, it should be used in the proportion of 1 pound of red squill powder to 9 pounds of bait material; if the toxicity is 600 to 800 mgs./kg, the ratio should be 1 pound of the poison to 7 pounds of bait. A stronger concentration than this is not recommended. These concentrations are based on obtaining a 90 per cent efficiency or better. In regions where a high acceptance of some suitable bait materials can be obtained, concentrations weaker than these may be used.

A satisfactory antidote for red squill has not been developed as yet. Because it is a strong emetic in itself, animals, with the exception of rats, void the poison very soon after swallowing. Occasionally, however, this does not happen, and so an effort is being made to find an antidote. This can be accompolished more satisfactorily when the toxic principle in red squill powder has been definitely identified. Good progress in the extraction of this active principle is being made, and a process is also being developed that will make it possible to fortify the powder to a uniform standard

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toxicity so that it can be purchased on the market with a known toxicity.

Strychnine Alkaloid. This poison may be obtained in two forms—crystals and powder, the powder being the one generally used. It is very slightly soluble in water but dissolves readily in chloroform (1 oz. in 1/3 pt.) or in alcohol (1 oz. in 3¼ qts.).

Strychnine acts mainly on the spinal cord and causes violent clonic, or intermittent, convulsions. These are accompanied and followed by paralysis of the central nervous system which results in the death of the animal in about 30 minutes.

The toxicity of strychnine to rats is about 10 mgs./kg, and the poison has been used in bait materials in the proportion of 1 oz. to 10 pounds of bait.

The use of strychnine in baits for the control of rats is not recommended, because the rats detect its bitterness too quickly and only a very small per cent of them will eat a sufficient quantity of the bait to kill them. Strychnine is, however, used in bait for house mice.

Strychnine Sulphate. This form of strychnine may also be obtained either as a crystal or as a powder. It is soluble in water (1 oz. in about 1 qt.), and its toxicity to rats is about 12 mgs./kg.

For strychnine poisoning in human beings the following treatment should be followed:

1. If the patient is not in spasms or highly nervous, give 1 teaspoonful of mustard in a cup of warm water to produce vomiting. If the patient is in spasms, omit this.

2. As soon as vomiting ceases, or immediately, give 5 amytal tablets (1½ grs.) with a cup of water to retard or reduce severity of convulsions.

3. After five minutes give 1 teaspoonful of tannic acid and 3 charcoal tables (5 grs.) together in a cup of water.

4. After ten minutes, give a cup of cream or warm lard.

In the case of poisoned dogs, substitute for No. 3, the following: Dissolve 1 tablet of potassium permanganate (5 grs.) in one quart warm water and give by stomach tube after the dog has become quiet, following No. 2 treatment. Repeat in 15 minutes.

Thallium Sulphate. This chemical may be obtained either as a powder or in crystalline form (in various sizes of crystals), the finely pulverized powder being the best for rodent control. It should be 99 per cent pure.

The lethal dose for animals is 25 mgs./kg. One ounce is soluble in 567 cc of cold water (11-1/5 pt.) or 156 cc (1/3 pt.) of boiling water.

Thallium sulphate may be used in baits in the proportion of 1 oz. to 6 pounds of bait material up to 1 oz. to 4 pounds of bait, depending on the locality and the type of bait material used.

The toxic action of thallium causes injury to the nerves and central nervous system and to the endocrine system, disrupting the regulatory secretions of the different glands and disturbing the calcium metabolism; it acts directly on the muscles and peripheral motor nerves and produces cardiac depression. The animal goes into a state of coma before it dies. The usual time to death is 72 hours. Nonlethal doses (8 mgs./kg) may cause loss of hair.

We do not recommend the use of thallium except by those experienced and trained in handling and exposing highly toxic materials for the control of rodents.

For accidental poisoning by thallium the first thing to do is to call a physician. The following treatment may be given immediately:

1. Give an emetic of mustard.

2. After vomiting has ceased, give 8 tablets (5 grs.) of sodium iodide dissolved in a glass of warm water.

3. After 10 minutes, give ½ teaspoonful of bismuth subgallate in a cup of water.

4. After 15 minutes, give two glasses of milk.

Zinc Phosphide. This poisonous substance may be obtained in a finely powdered form. It is insoluble in water, slightly soluble in alkalies or oils.

It has a toxicity to rats of about 25 mgs./kg, and may be used in bait materials for rats in the ratio of 1 oz. to 6 pounds of bait, and for mice in the ratio of 1 oz. to 10 pounds of bait.

Zinc phosphide should be handled with care and under supervision of trained men.

In lethal doses the phosphorus acts directly on the muscle fibers of the heart and causes paralysis and cessation of cardiac action.

In case of accidental poisoning by zinc phosphide, the following treatment should be given:

1. Give an emetic of mustard.

2. After vomiting has ceased, completely dissolve one tablet (5 grs.) of potassium permanganate in a glass of warm water and take.

3. After 10 minutes, give ½ teaspoonful of copper sulphate in a glass of water.

4. Fifteen minutes later, give 1 tablespoonful of epsom salts in a glass of water.

Calcium Cyanide. This material is being used extensively in rat control work where rats are sufficiently confined in burrows and in city dumps. It is an effective method of control where the rat habitat is suitable and where it is safe to use.

For calcium cyanide poisoning the following treatment is suggested:

If excessive amount of cyanide fumes have been breathed, give patient plenty of fresh air and let them inhale amyl nitrite. If the cyanide has been swallowed, the stomach should be immediately emptied with a stomach pump and at the same time the patient allowed to inhale the myl nitrite fumes. In each case, these treatments may be followed by the administration by a physician of Dr. Chen's combined treatment of sodium nitrite and sodium thiosulfate.

The fatal action from cyanide poisoning may be rapid, but again cyanosis or unconsciousness may continue for three hours or more so as long as the victim's heart beats, antidotal treatments should be applied.

There is one precaution that operators should take in handling any of these poisons and that is during the preparation of poison baits. Do not allow the toxic agent to remain on the bare hands too long so that absorption through the skin may occur. This is particularly true of those used in solution.

From these various poisons one can select that one that will best suit the conditions under which the poisoned bait is to be used. At the present time we are recommending for distribution to the public only the red squill powder for it is the safest to use. Thallium, arsenic, zinc phosphide, and barium carbonate should be used only under close supervision and should be exposed by those trained in handling highly toxic preparations.

It is not possible to state definitely what bait materials are best to employ, for local conditions largely determine that. You are all familiar with the kinds of bait generally used, so they need not be repeated here.

Suppose we select one standard bait material that is attractive to rats and make various kinds of poisoned baits of it, using the poisons herein mentioned in the proportions suggested in the chart, and ascertain in what order the baits will be selected by the

rats. This is difficult to state definitely because the rat is a strong variable factor, but basing judgment on the manner in which they have been observed to select, we may predict that they will select in this order: Thallium, arsenic, red squill, barium carbonate, zinc phosphide, and strychnine. They will repeat in about the same order.

The question has often been asked whether any of these poisons prevent odors or whether any embalm the carcass of the rat that has died from having eaten it. This can be answered in the negative. It is true that arsenic and thallium have the property of preserving flesh if used in sufficient quantity, but an animal will not eat enough to have such an effect on the dead body; nor will any of these poisons dry up the carcass so as to prevent odors.

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Campbell C. Baird, President of Baird & McGuire, Inc., Dies

It is with deep regret that we must announce the death of Campbell C. Baird, at his home in Norwell, Mass., on Dec. 21st, last. Mr. Baird was President of the N.A.I.D.M. during 1923-1924, also one of the founders and, for a great many years, a member of the board of governors. His passing is indeed a loss to the entire American Disinfectant Industry, with which he has been associated for more than a quarter of a century.

H. W. Primising Passes

Mr. H. W. Primising, owner and operator of the Advance Termite Control Company, 3554 East Slauson, Maywood, died at the Veterans Hospital in Sawtelle, Dec. 2, 1940. Mr. Primising was also a member of the Bonded Termite Operators, Inc., and many fraternal organizations. His passing will be mourned by everyone who knew him for he was a splendid example of truth, honesty and integrity.

Air Conditioning A la Nature

In hot weather certain bees stand at the hive entrance and blow fresh air inside, wings beating 11,400 strokes a minute, says Edwin Way Teale, author, in his opus "The Golden Throng." (Pub. by Dodd, Mead & Co.)

Entomological Literature

"Diseases of Flowers and Other Ornamentals" is the title of a recently issued 108 page booklet by the College of Agriculture, Berkeley, Calif. Circular discusses diseases and their control, of shrubs, flowering and shade trees, flowers, lawns of California. Copy may be had by writing College of Agriculture and asking for Circular No. 118.

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How Insecticides Kill

By ROY HANSBERRY, *Cornell University, Ithaca, New York*

EDITOR'S NOTE: *The following paper was read by Dr. Hansberry at the Eastern Pest Control Operators' Conference, Massachusetts State College, Amherst, Mass., January 15, 1941. Dr. Hansberry is Assistant Professor, Insect Toxicology.*

A DISCUSSION of a question as broad as this must be limited for presentation in any reasonable space. It is proposed to confine this discussion to a consideration of a few recent and representative pieces of research dealing with insects and problems encountered by pest control operators.

Insects differ from vertebrate animals in several important ways. Since the structure and function of various organ systems in insects is so important in any understanding of how insecticides work to kill them, a few of these characteristics of insects should be reviewed briefly:

Respiration: — An insect has no lungs. The tracheae branch and divide until not only each organ but each group of cells is supplied with finely divided air tubes. The openings of these tracheae, called spiracles, are arranged in from one to eight pairs along the sides of the body. Some insects are able to "breathe" by pumping air in through some of the spiracles and out others. The cockroach and other active insects circulate air in this way. Less active forms may depend on diffusion alone to carry oxygen into the body and carbon dioxide out.

Circulation:—The heart of an insect is a simple tube open at both ends and lying along the back of the insect. The blood is pumped forward through this tube and flows into the open body cavity near the head. As it passes backward through the body cavity it bathes all the organs finally being sucked into the heart tube at the back by the pumping movements. Except for the tube and a few simple channels there is no arrangement similar to our blood vessels. The blood cells are generally colorless, do not contain hemoglobin, and probably have no respiratory function.

The nervous system:—The "brain" of an insect is divided into from three to twelve parts distributed in the various segments of the body and lying along the floor of the body cavity. Notice the position of this "spinal cord" below the digestive organs instead of along the back as it is in vertebrate animals. These ganglia or concentrations of nerve cells control their respective parts of the body more or less independently, so that the body of an insect may be kept alive for days without the head and its nerve centers.

The skeleton: — No integral bony structure is found in insects. The outer skin, however, is hard and horny and arranged in a series of movable plates. This outer skeleton serves for muscle attachment, to hold the body shape, to prevent water loss and all the other combined functions of the skin and skeleton in vertebrates. It is shed periodically and while a new one is being formed and hardening, the insect is very susceptible to any injury.

How Fumigants Kill

Fumigation problems generally include penetration of the fumigant, first to the insect and then into the insect's body. Assuming the fumigant to be toxic, its relative effect is based on how readily and completely it can enter the insect's body. Since the "skin" of an insect is rather impervious to some gases, it will be anticipated that the spiracles and tracheae play an important role in penetration of fumigants.

The movement of gases through an insect respiratory system is increased with rising temperature. This is true whether the gas is poisonous or not, and whether the gas simply diffuses or is pumped in by active movements of the insect. This observation enables us to explain one of the important facts of fumigation technique: that fumigations are more efficient at high than at lower temperatures.

Some insects can "hold their breath" by closing the spiracles. When this happens the fumigant can not enter the body readily and the insect becomes temporarily resistant to the toxic action of the fumigant. It has been observed that carbon dioxide and certain other materials make an insect open its spiracles, so that by mixing a fraction of carbon dioxide in with an ordinary fumigant its toxicity will be greatly increased. However, even if all the body openings are sealed with wax, an insect can be killed much more readily in a fumigating atmosphere than it would be killed by simple suffocation. This means that fumigants can also enter the body wall directly. As mentioned above the covering is in the form of plates, and between these plates are areas where the integument is thin and quite pervious to gases. In fact it is possible for a roach to be poisoned with nicotine by simply placing a tip of the antenna, leg, or wing in an atmosphere saturated with nicotine vapor. The spiracles and tracheal system furnish such an efficient means of entry for fumigants, however, that penetration of the integument probably is not important in most fumigations.

Very little is known as to how fumigants kill after they reach the cells of the body. The fact that some of the better insect fumigants are not toxic to vertebrates, and *vice versa*, warns us against applying to insects any of the known facts of toxicology of poisonous gases to humans. For instance cyanide has long been known to act on humans and other vertebrates by destroying red blood cells. How then shall we explain its acute toxicity to insects which have neither red blood cells or other tissue comparable to them in either structure or function?

How Contact Insecticides Kill

As with fumigants, the penetration of contact insecticides is an important part of their power to kill. With liquid and dust insecticides the integument becomes the important path of entry of the insecticide into the body. Although it was once believed that contact insecticides had to enter the tracheae in order to kill, it is now known that the respiratory system plays a comparatively minor role. Careful experiments in the last ten years have shown that pyrethrum, rotenone, nicotine, oils and even arsenic and fluorine can and do penetrate the integument directly. Most of the normal penetration is probably through the thinner parts of the connective membranes, but even such comparatively horny parts as the pronotal shield between the head and wings of the cockroach can absorb arsenic, oils and other materials directly into the insect's body. Just how the toxic principles of a dry dust

are put into solution and passed through the body wall is not easy to understand, but repeated experiments have proven that it does happen.

The tracheae and spiracles also assist in the absorption, particularly of such insecticides as very light air floated dusts or oil fogs.

Because of the tremendous importance attached to contact and penetration in the performance of contact insecticides, much attention is logically given to supplements, variously called wetters, spreaders, stickers, conditioners, penetrants, activators and other similar but rather meaningless names. The aim of most of these materials is to cause the insecticide to contact the insect more closely, to deposit larger amounts or to cause it to penetrate the body more readily. Without going into detail it can be said that a surface-tension reducer such as soap or a sulfated or sulfonated compound will improve an aqueous spray in this respect. A small amount of oil will frequently improve a dust, although too much may make it difficult to apply evenly. Although atomized oils already have excellent wetting and spreading properties, patents have been issued for the use of supplements such as aluminum naphthenate and diglycol laurate to improve their wetting, spreading and penetrating properties.

An important consideration in the use of atomized oils is their droplet size. While the effect of droplet size on the efficiency of the oils is not completely understood, it is probable that too small droplets are unable to wet the insect as well as larger droplets would. Other factors being equal droplet size decreases with increased spray pressure or higher viscosity oils.

The toxic effect of pyrethrum is probably due to a paralyzing effect on the nerves and nerve ganglia. A disruption of the tissue in nerve ganglia can be observed microscopically in poisoned insects. In contrast to the rapid paralyzing action of pyrethrum, rotenone acts much more slowly. Most entomologists who have experimented along those lines have concluded that rotenone acts directly or indirectly on the insect's respiratory system, interfering in one way or another with its ability to use oxygen. Nicotine has a more general action, and although it has been demonstrated to be present in nervous tissue after poisoning, it appears to penetrate readily to all parts of the body once it is introduced into the body. The writer believes on the basis of unpublished experiments that it acts on all living body cells more or less simultaneously. The toxicology of fluorine, and petroleum oils is relatively unknown.

How Stomach Poisons Kill

The pest control operator is interested in two types of stomach poisons, namely, cockroach insecticides and moth proofing preparations. The stomach poisons efficient against cockroaches are fluorine in the form of sodium fluoride and phosphorus. While sodium fluoride is capable of being absorbed by the integument and hence acting as a contact poison, it also kills by stomach poison action, gaining access to the digestive tract when the roach cleans its legs and antennae with its mouth parts. Even the vapor of phosphorus is toxic to cockroaches if it is confined with the insects. Phosphorus is one of the more toxic insecticides, very minute doses killing the American roach and somewhat larger doses being fatal to the German roach. Although large doses may kill in 24 hours, the smaller doses may not cause death for as long as a month. If a roach

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becomes visibly affected, it rarely recovers. Thus in spite of its slow action, it is a very efficient insecticide for American roaches.

Mothproofing compounds which are efficient and permanent are generally trade secrets, so little is known about their mode of action. The temporary mothproofing preparations are generally fluorine compounds. Really permanent mothproofing is obtained only by treatment in the hot dyebath where the compound actually enters into chemical combination with the fibers of the cloth.

New Organic Insecticides and Specificity

During the last ten years at least 20 new organic insecticides have appeared on the market. A considerably greater number are in the process of being developed at present. The interesting thing about these new materials is that most of them do not compete with one another. This demonstrates a significant fact about organic insecticides, namely, their specific application to a few insects. Because of their newness, little is yet known about their manner of toxic action. But it has been repeatedly observed that although they may be highly efficient in the control of a few specific insects, they are practically useless for others. In fact, this specificity of action is not limited to the new organics, but is exhibited, not only by the more standard organic materials such as pyrethrum, rotenone and nicotine, but even by the arsenicals and fluorine compounds. It is of considerable importance in insect control to recognize and apply this characteristic of specificity of insecticide to different insect problems. Just as the once bright hope for a panacea in medical practice has been abandoned for an amazingly complicated specificity of medication, so must the insect control specialist become familiar with more and more different insecticides with specific applications to individual problems.

Since it has not been possible to more than introduce this problem in such a brief discussion, there is appended a list of references to more complete discussions of the subjects referred to above.

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Bubbles in Glass Repel Vermin and Rodents

At the 100th meeting of the American Chemical Society in Detroit recently, Dr. Alexander Silverman, head of the Dept. of Chemistry of the University of Pittsburgh, who was chairman of a symposium on glass and its uses, stated that glass is purposely made full of bubbles because it is a good insulator and kept out vermin and rodents.

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Pest Control Rackets and Their Relationship to Your Industry

By **W. E. McCAULEY**, *Urbana, Illinois*

EDITOR'S NOTE: *Address by Mr. McCauley at National Pest Control Association Convention, Indianapolis, Indiana, October 29, 1940.*

"The Indianapolis Convention of the N.P.C.A. will probably go down in history as the turning point that is expressed in a determination to arrive at fundamental practices in the elimination and control of various insects and pests. Termite control has come in for much criticism. No punches were pulled in discussing this matter at the Indianapolis Convention. Two interesting papers, followed by discussions culminated in unanimous approval to set up a National Association 'Termite Policy.' The oft referred to 1-2-3-3½ principles of Termite Control (National Association membership service letter No. 166) will serve as the basis for standard or minimum specifications and issuance of a 'Certificate of Performance.'

Members of the National Pest Control Association will have an opportunity to qualify and it is expected that examinations will be given from time to time so that the members may come under this 'Termite Policy' plan. There is nothing coercive or mandatory about one taking the examination. It is optional but at the same time it is expected that many members will avail themselves of this method of becoming identified with a plan that will gain public respect and confidence. It should also be said that it is not the function of the Association to cause members to use any specific chemical but rather the plan is for the purpose of having termite operators recognize the importance of speaking the same language when it comes to termite control."

IT HAS fallen my lot to bring to you today a suggested action which, if successfully carried out, will mean a vast improvement for your industry. I firmly believe this, and the fact that I am here now is evidence that many of your members believe it.

It is my intention today to bring before you recent information relative to various types of swindles or fraudulent operations performed in the Midwest by men who, in the eyes of the laymen, are exterminators. Gentlemen: **the fraudulent operator is one of this industry's most serious enemies.** The public conception of the pest control operator at the present time is greatly influenced by contacts or heresay relevant to fraudulent operators of one kind or another. I want to take a few cases from correspondence files which will give you a specific idea of how some of these **crooks** operate. And I **do mean crooks.**

First I want to cite the case of the most vicious type; the outright swindlers who seek out widows or maiden ladies without regard for anything except that the victims chosen have a home with some source of funds. I'm sure all of you have examples of your own but I'm taking for an example the case of Mrs. Arnold from a small Illinois town. In the lady's own words her trouble all started in March, 1939, when "a Mr. Sutton came and asked to look the house over for termites. I let him look and of course termites were found; he showed them to me and sold me a treatment—the bill $150.56. This Mr. Sutton represented the Central States Termite Control, 273 Maple Street, Wabash, Indiana. This first treatment required eight hours. In October, Artie Ellis and another man came and told me that the Central States Company had sold out to them and had failed to give them the contract on this house. He asked to see my copy. I obliged him and also allowed him to look about. He was very thorough and succeeded in locating a bad infestation (above all places) in the attic. They convinced me by showing me a handful of termites. Of course these had to be treated and the material they used cost $1.75 an ounce and came from Argentina. Their bill was $227.50, which I paid. In November two more men came; a large man rather dark and foreign looking, Mr. R. J. Wagner, and a Mr. Fitzgerald, a large, heavy-set man with florid complexion and sandy hair. The latter did most of the talking and, of course, they found that all the work had to be done over to the tune of $300, but they didn't get it all. I stopped payment on a $100 check.

"This Mr. Fitzgerald really put on the pressure and I can now analyze my reaction as a sort of fear. It seemed I was powerless to help myself. I will consider my $588 well spent if by any means it will help convict these crooks."

I want to explain that a subsequent examination by myself revealed that there never have been any termites in this home so far as is possible to determine. No structural changes were made and there was no evidence of chemicals at the time of my examination. This case is only one of several involving these same men. They have worked the same way in all cases so far called to our attention, except in one instance the house actually had termites—before they treated it and after they treated it.

This group of men and others associated with them have used the following names:

Central States Termite Control, American Termite Control, Wabash Termite Control, Independent Termite Control.

They have given the following addresses:

Mishawaka, Wabash, Indianapolis, Indiana; Decatur and Beardstown, Illinois; Hannibal, Missouri.

Incidently, we believe Professor Davis' friend, James King, was connected with this same gang before his leave of absence took effect. Another of their lesser men was caught this summer in Southern Illinois, but he professed complete ignorance of the gang's operation or whereabouts and since there were no serious charges against him I do not think he will fare badly.

I know many of you shrug your shoulders and simply say that anyone foolish enough to fall for that gag deserves to be swindled—but remember, gentlemen, I'm not here to ask sympathy for the victims of these men. I'm here to tell you that every time one of these cases gets publicity, it hurts the industry to which you look for support. If you don't believe me, I'd like to suggest that you go into a town where one of these jobs has been pulled and try to talk termite control. Believe me those folks are "on to you" before you get started. You're just "another one of those bug killers."

We, of course, have a great many other types of fraudulent operators. Another common one is the company which sends many representatives to all parts of the state selling termite control to everyone whether or not they have termites, getting all sorts of prices, giving long time guarantees, and then failing to fulfill their

promises the next year. Investigation usually reveals that they **left town** and further investigation shows that the **same men** are operating the **same type** of company under a **new** name from **another address.**

Still another is he who fumigates with carbon disulfide and claims the world's best remedy; giving longtime guarantees with two inspections annually for small prices, then fails to show up at all after the first treatment. Many of this latter type are itinerants traveling from town to town soliciting from door to door. Oftentimes they use a name very similar to that of an established concern which has advertised in the territory being worked.

All of the foregoing types of operators can be characterized as (1) House to house sellers, (2) whether or not a place has termites is of little concern so long as they can frighten the owner into a job, (3) the work they do is of questionable value. Many examinations of infested property treated by this type reveal termites still working, (4) their promises are seldom kept, (5) their prices seem to vary with the ability of the owner to pay rather than with the work necessary, (6) their material is a secret formula known only to them, (7) their address is usually wherever you find them, seldom close to home.

Probably a less dangerous type of operator, but nonetheless dishonest, is the borderline group who make reliable treatments but who have salesmen that either do not know termite damage or who are so pressed for funds that they repeatedly sell termite control work to owners of property where no termites exist. All of you are too familiar with this type. We all know of other innumerable cases which have given this industry a pair of dark-colored eyes. Time will not permit going further with them, but I want to point out other factors which influence public opinion.

Fraudulent advertising whether by operators themselves or by wholesale houses cannot but result in disgusted consumers. Your service letters have carried much information for your consumption, but I'd like to emphasize the guilt of the wholesaler who makes misleading claims about his products. This single item can be pointed to as one most important source of the racketeer type of operator. Every company which sells products to the P.C.O. should be under some sort of surveillance by the National Association to prevent or at least expose, false claims or questionable recommendations. Such a plan was suggested some years back but so far nothing seems to have been done about it.

Still another manifestation of this industry's status is the very wide range of prices quoted on the same work. The customer is left in a state of dissatisfaction when there is quoted to him 200 per cent price variation on the same job. I could go on citing examples of the need for unification within the industry as a means of influencing public opinion. But instead I want to turn the mirror around, that is, point out inconsistencies within our own ranks—within the field of entomology.

I feel justified in doing this because there are present several entomologists who have the responsibilities of handling the pest problems in which you are mutually interested. Most of those here have had the advantage of the steadying influence which contact with your association gives. I want you to know and realize that your attempts as an association to standardize methods (as in service letter 166 on termite control) has influenced entomological thinking and writing, whether you realize it or not. Probably the most frank discussion of this matter to date was the address by your president, given at the North Central States Entomologists' meeting in March, 1940, published in PESTS, May, 1940. I commend him for this presentation and regret that more entomologists cannot have access to it. My only hope is that he meant it when he said (speaking for you to the entomologists): "We are, and we're going to keep on being, sticklers for the truth. Misleading the public . . . is not in our line. We believe we have had reasonable success in convincing our friends, the entomologists, of this. We are going to continue hammering on the same theme until we convince you beyond all shadow of a doubt that we are in earnest—and at the same time we intend to prove to you that **we mean business when we ask of you a better correlation of your activities and ours.**" To crystallize what Mr. McCloud might have had in mind let me quote from various entomological publications recommendations for termite control. (1) "Recently certain chemical barriers have been developed which appear to be satisfactory . . . provided they are properly installed. Such barriers may be either toxic or repellent and in either case they should be **injected into the wood under from 300 to 400 pounds pressure.** The important thing with chemical barriers is to obtain good penetration and to inject enough material to saturate the timbers, literally building a chemical wall around the structure and making it impossible for the termites to maintain their contact with the grounds." In another place this same bulletin states in speaking of trench treatments, "The paradichlorobenzene is used as crystals at the rate of **5 pounds** per linear foot."

(2) Another bulletin states in italics, "Treated lumber does not function as a shield." Under chemical treatment this same bulletin states, "Dig a narrow trench, 8 to 10 inches deep completely around all piers, drainpipes and along the **inside** of concrete or brick foundation walls." (Note the inside only is mentioned.) "Pour either (a) a mixture of coal tar creosote (1 part), and lightweight fuel oil (3 parts); or (b) crude orthodichlorobenzene into the trench at the rate of one to two gallons for each 10 linear feet of trench. The trench is then half filled and the application repeated. The trench is then filled." The cost of (b) treatment is ten times that of (a), yet not a word is said of their relative merits.

(3) Still another bulletin speaking of chemical treatments recommends "to poison the soil adjacent to the foundation all around the house and porches by digging a trench along side the foundation to a depth of 10 to 12 inches and pouring into this trench ortho-dichlorobenzene at the rate of one gallon to each 10 linear feet replacing the soil that has been taken out." In this case no mention is made of treating the soil that is replaced.

(4) Another leaflet states that "Upon discovery of the point where termites enter the ground, they may be killed by the application of **one ounce** of paradichlorobenzene crystals per linear foot of foundation."

(5) Still another publication suggests that where possible the main colony should be dug up and treated with a toxic oil and also that the wall where termite tubes were found should be thoroughly soaked with creosote.

These are but a few examples of "authoritative" statements concerning the handling of termites which illustrate the conflicting, misleading statements all too common in literature dealing not only with termite but with all pests in the field of household insects. It would be interesting to know upon what facts these statements are based. To you P.C.O.'s I suggest **action** through a strong committee on relationship with the entomologists. Pointing out existing inconsistencies should help. Principles may be argued later. To you entomologists I ask if we cannot look to someone to lead us out of such a conglomeration of uncorrelated statements. Per-

haps the federal entomologists can show us the way. Perhaps a committee of the American Association of Economic Entomologists could be formed to **act** along the lines of coordinating the existing recommendations. Certainly more facts are needed or at least a better interpretation of the existing fact. I know that I'm not alone in feeling as I do about the publications dealing with household insects. I sincerely hope we can get the wheels of correction moving in the near future. These conflicting statements do not excuse a failure on the part of the legitimate operator, but do play into the hands of the fraudulent.

But let's get back to pest control rackets. Since they are one of your industry's chief enemies is it not logical that your association, as an association, take action against the fraudulent operator? The following advantages should be gained by the association if such action is taken:

1. Strength would be gained by the unifying action of fighting a common enemy.

2. The association automatically separates its membership from the fraudulent by taking action against the racketeer type. (It is assumed, of course, that there could be no place in the association membership for fraudulent operators.)

3. Such action should forestall state legislation designed to curb these racketeers which might act as a boomerang to the legitimate operator. Certainly the cost to you should be less if you carry on through the association than if you are forced to support legislation (whether you like it or not).

4. Desirable publicity and a much stronger public relationship should result from sincere effort by the association membership to curb the activities of unreliable pest control operators.

5. Such a program should receive immediate cooperation from various governmental agencies who in turn are in a position to boost the standing of the pest control industry.

Just how such a goal is to be accomplished is beyond the scope of my presentation. However, I do want to refer again to the desirability of unification of thought in terms of a program of action for the handling of each pest. For example, the 1-2-3-3½ program for termite control (with the possible addition of a word about continuation by inspection) as outlined in service letter 166 is a step in the right direction.

Before closing I wish to repeat my two chief suggestions: (1) Since the fraudulent operator is a major industry problem, the National Association of P.C.O. should take positive, aggressive action to curb such activities.

(2) There is a great need for action on the part of entomologists to better coordinate the publications both past, present, and future which deal with pests in your field of endeavor. I suggest your continued insistance and cooperation in this direction, at least until the goal is reached.

By **H. JENNINGS**

I THINK that the problem of answering this challenge (the challenge of the itinerant or incompetent "quack") to our industry must have a definite plan. It must have a definite set of machinery that will make it go—machinery that will operate smoothly. No group can be strong

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enough to do a policing job unless it has three essentials, and it is obvious from Mr. McCauley's story (of fraudulent operators) that we must do a policing job.

One, it must have unity of action, **to agree on a proper code and minimum standards for a job.** We have stressed that point for several years. We have heard that from the best informed men in the termite work. They have talked it to us and have repeated it to us at meeting after meeting, and I think that is the first essential.

Two, we must have **the power and will to enforce this code of minimum standards.**

Three, we must have a **delegated authority to punish offenders who do not maintain the standards set.** By that I want you to know that I don't mean a slight rebuke, I mean this thing must have "teeth" in it, and you have to be willing to put "teeth" in it and to be willing to allow proper regulation, and to give the authority to those people you do select to regulate it, not only over the outsiders but over yourselves as well.

Other groups have accomplished it. It is true that some of those groups are older than we are, but if you think a minute and read your histories carefully, you will find that it was only about six generations ago that the sign of a doctor was a barber pole, and he was called a "bleeder". Now in about six generations the doctors have come a long way from that, but we can't wait six generations. I hope we can start **our** progress **now.**

The American Medical Association is united in its stand. It will not tolerate quacks within its membership, and thereby helps to protect the public. It gives authority to representatives of the Association to make rules of conduct, and gives executives of the Association the power to punish offenders by banishing them from its membership. It also cooperates with civil authorities to prosecute offenders, and to educate the public in choosing between quacks and legitimate practitioners.

Now how can we accomplish this end in our organization?

One, we have to **educate our membership,** because it is quite evident that we have a good deal to learn. If we have a willingness to learn, we now have the places to learn. We have our conferences and conventions as a medium of exchange of ideas. These will be educational and may be used in educating our membership to do a better job.

We must be prepared to do a good job. We can do this by attending educational conferences, by independent research, and cooperation with the state and government research agencies to clarify and make uniform the information that the public receives. This is in line with what Mr. McCauley was telling you about the great variance in the information given out by people in authority. We can do a conscientious job in preparing our minimum standards for a good job so that the public will know what to expect from us. If we do those things, we have accomplished the first purpose.

Two: We can form a bloc to demand increased and needed state and federal government research in problems of insect and rodent control. We must make the people who have control of the public funds realize that we do need their help, and that we must have intelligent research.

They have the key men for the finest research group that we could ask for; the key men to that group have cooperated with us better than anyone could have asked. Those men need help in their work, and need time to do the work we need to have done.

Let us show the need for codification of conflicting public bulletins, and help directly. After we have prepared ourselves to do the job right, we must identify ourselves as the capable ones in the eyes of the public. We must make membership the hallmark in our Association of quality work. We must teach the public to recognize that hallmark of our profession, and to respect it.

By using the name and seal of the Association in carefully planned, legitimate advertising, and by Association news releases and educational advertising of the Association's educational activities to the public, we can teach the public to recognize our seal as the mark of quality in our industry.

As an Association we can offer to cooperate with research workers who can be helped by us as a group, and put the results of research into intelligent work.

We must conscientiously do our own work (1) without misrepresentation, (2) by careful choosing of our employees, (3) by the use of tested methods and chemicals.

It was a year ago at this time that I asked for a group to investigate the claims and the products that were offered to us under the most ridiculous claims, without verification of the facts except by some kitchen chemist, and there has been some work done on that part of the program.

Fourth, by the use of standard bonds and guarantees that create customer confidence and hold it. In other words, I want you to know that the plan I present is based on one guarantee, the wording of which will be standard. The public will know it, and they will know it is the guarantee of this Association. You won't take out a few words here and put

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When Writing to Advertisers Mention "Pests"

in a few words there. Our certificate of performance is going to be backed by a uniform guarantee. It is your privilege not to use it, but my thought is that the backing of the Association should be behind **that** guarantee to the public.

I assure you this will increase your profits, if you will follow this plan. We must be strong enough as an Association to be able to **make our identity as a member stand for a past record of good performance.** We must be strong enough as an Association to **have unity within the Association,** strong enough to **demand that members keep that record clean.** We must be strong enough as an Association to **expel members who do not maintain that record,** whether it be by incompetence that they fail, or by knowingly defrauding the public. We must be strong enough to **assist the public in identifying quacks and prosecuting them.**

We can do this by news releases to educate the public, by cooperation with Better Business Bureaus and by offering our cooperation to state and federal entomologists who receive complaints and who—because of their lack of manpower—are not able to go out into the field and check them accurately. We can do that "leg work" for them, and it will rebound to our benefit, because if we do it properly, they will learn to believe in us and to count on our honesty and ability.

We can do it by reporting quacks to the authorities in our own Association. I mean quacks in our own Association. We have them. We can help by giving assistance to civil authorities in prosecuting the quacks, be they members, ex-members or non-members.

The mark of membership must be made so important in the eyes of the public that it will be a thing of value to the membership, just as membership in the American Medical Association is a badge of good standing in the medical profession. The public should be offered some concrete evidence by the Association member that he, as a member of the Association, is qualified to do the job. The customer should be taught to rely on him because he **is** a member in good standing.

This could be accomplished by putting the necessary machinery in motion to carry out the suggested plan. I believe the necessary examination should have (1) a requirement for actual apprenticeship. I want you to consider that point carefully. I don't think a man can learn termite work out of books. I think he has to be trained **on the job.**

(2) That there should be an examination and certification of the competence of that member, the examination freely entered into of our own free will. We will take the examination so that we can be identified by the public. This examination would be held at the regional conferences, and taken by the P.C.O. by his own free will, and not as a part of any state licensing program.

After all, under state licensing programs, there is that sales argument of, "Well, we're all licensed—we all do our work alike." You've all heard that story. But this is something more than a license. The doctor may be licensed to practice, but his membership in the American Medical Association marks him as just a little stronger than the other man. Proves him to be **recognized** as a qualified M.D.

In that examination I believe there should be a pledge similar to the doctor's oath — that we will agree to maintain the minimum standard we have set up. The passage of the examination should carry with it a promise from the P.C.O. that he will perform his work under a code of minimum standards set up on the

LEADING FUMIGATORS

ARE ADOPTING

ACME *FULL VISION*

Acme Full Vision Gas Masks, equipped with Acme Type HCN Canisters, are rapidly being adopted by scores of the largest fumigators and gas mask users in the country.

FULL VISION, an exclusive Acme feature, affords the wearer unobstructed vision, and provides greater safety and efficiency.

Write for Folder M387 on Acme Canister Masks.

Acme Protection Equipment Co., Inc.

Manufacturers of Respiratory Protective Devices

3605 Liberty Ave. Pittsburgh, Pa.

Rat and Mice Exterminating Liquid

Per-Mo Rat and Mice Exterminating Liquid can be used as a drink or can be mixed with any food and used as a bait.

Economical to use and a "Guaranteed" Rodent Exterminator.

If you wish an 8-oz. sample send 25c in stamps or coin to cover packing and postage.

USE

Per-Mo for Your Mothproofing Service

Per-Mo Mothproofing Treatment will prevent moth and carpet beetle damage to Upholstered Furniture, Carpets, Rugs, and Clothing for FIVE YEARS and to Blankets that are laundered for a period of THREE YEARS.

Per-Mo Mothproof is a colorless and odorless liquid, that is applied to any woolen fabric with a spray-gun, either electrically or hand powered. Write for full particulars.

Salesmen and Jobbers Write for Exclusive Territory

PER-MO MOTHPROOF CO.

3729 Virginia, Dept. M. Kansas City, Mo.

1-2-3-3½ principle. We should build a minimum standards code on the good foundation we have built in our service letter No. 166.

After the passage of the voluntary apprenticeship and examination requirement, this Association would provide a **certificate of performance** which would be backed by a blanket performance bond, held by the Association. Let me explain that point. We are not going to give the customer a performance bond by the Joe Doakes Insurance Company or this insurance company or that, because then we come into conflict and competition—selling whichever is the best insurance company rather than ourselves as termite control operators. We are not insurance salesmen; we don't know enough about insurance, but our committee could select the best bond that they could possibly get and improve it from year to year, and you would be issued a certificate on the basis of that backing. I believe that such a certificate of performance would be a real asset in our selling efforts, and would better enable the P.C.O. to stand apart from the quacks with whom he must compete.

Equally important, this plan will give the public an easily identified source of good work. In all your advertising, you try to make it easy to buy. You try to make it easy for the customer to see that you are the best man. In this case you are giving the public a very easy method of identifying you. The failure to perform or carry out the terms of the agreement, (which would be the standard recommended agreement form of the Association) would entail the loss of the privilege of the use of the certificate of performance of the Association, and possible expulsion from the Association if the member did not show a willingness to correct his errors or continued to lack good faith in dealing with the public.

This is the plan that I would like to have you consider. The plan sets up the machinery for identifying us as good operators rather than quacks, it gives a means of helping to identify the quack so he can be prosecuted, and gives us a means of making the mark of our Association the hallmark of quality work in this field.

The committee would appreciate any comments or discussion.

If we can work this and do a good job on it in the termite field first—the field of fumigation can follow and other branches of our work could very easily follow, but this is the one situation where the racket publicity-problem is most prevalent; if we can work it out on this part of our work we will have the experience and know how to handle the other problems that will come up in the future.

At the present time, in the southern states, there is a continued tendency toward legislation. We are not offering this as a substitute for legislation, but you can see that this plan, if prepared properly and given proper powers of enforcement, can serve as a model law and can be used as a guide in preparing legislation that is necessary. I am sure that the legislators who are interested in making these laws would be interested in viewing a working, workable plan that would do what the law really wanted to do.

I don't say that it will stop legislation. I don't intend that it should, where it is necessary. It may be that this will have to be backed up by legislation, but it will be a lot less expensive for you as good operators if it does make it unnecessary to have legislation.

Remember that there is nothing stable in human affairs; therefore, avoid undue elation in prosperity and undue depression in adversity.—Isocrates.

A PREPARED RAT BAIT

19½c PER POUND IN ONE POUND TIN CANS
NO FUSS - NO MUSS - NO MIXING
USE

HAN-DEE* RAT KILLER

HAN-DEE Rat Killer is a scientifically prepared rat bait, which is mixed ready for use, you simply open the can and place the baits with a spoon. The toxicant is oven dried red squill, which has been biologically tested.

HAN-DEE is packed in MEAT, FISH and CANTALOUPE baits to afford you a variety of baits, for your convenience HAN-DEE is packed in one pound sealed tin cans—no stale bait to be used next day with HAN-DEE, always ready for use when you need bait.

HAN-DEE may be used with safety in restaurants and packing houses where poisonous materials are prohibited.

Packed in cases of three dozen, one pound cans, either in one kind of bait, or any assortment of the three baits.

Write For Descriptive Literature

	Per Doz.
THREE DOZEN (1 CASE) LABELED	$2.50
GROSS LOTS, LABELED	2.40
GROSS LOTS, NO LABELS	2.35

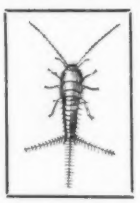
Freight prepaid on gross lots to all points east of Rocky Mountains.

*Formerly SUR-RID

SUR-RID PRODUCTS COMPANY
455 PAUL BROWN BUILDING, ST. LOUIS, MISSOURI

"Positive" - "Safe" and "Sure"

USICO SILVERFISH CONCENTRATE



"FACTS"

KNOWN WORLD WIDE!

(1) It will exterminate all Silverfish in building completely and properly treated within 40 days; ONE TREATMENT will protect against reinfestation for THREE YEARS.

(2) Harmless to human beings and animals, simple to apply, no tearing up or marring woodwork, yet placed away from any chance of removal. No inconvenience to tenants whatever.

(3) One pound will treat completely—three 2-room apartments, two 3-room apartments, or a basement room 20x20.

(4) It has fulfilled every claim made for it, under the worst conditions known. Write for testimonials.

(5) "NEW LOW PRICES"—$1.00 per pound, f.o.b. Seattle, Washington. Minimum amount 10 pounds. Shipped express.

(6) *Don't envy the exterminator who can guarantee the above performance, be one!!!*

U. S. INSECTICIDES CO.
412 Hoge Building Seattle, Washington

Report of Committee Cooperating With Pest Control Operators

(Submitted by the Committee to the Annual Convention of the American Association of Economic Entomologists, Philadelphia, Pa., December 30, 1940.)

Your committee on Cooperation with the National Pest Control Association, having met with the committee of that association and discussed at length the problems of mutual interest, begs leave to report as follows:

1. **Legislation.** We commend the National Pest Control Association in its efforts to regulate and standardize, within the industry, the service operations of the commercial pest control operators, as evidenced by the activities and reports of its committees dealing with Fumigation Practices and Termite Standards and Procedures.

In considering state legislation which may become necessary we propose and recommend cooperation with the pest control industry in the drafting of such basic principles as might comprise a fundamentally acceptable law.

2. **Literature.** Because of the lack of research in the field of household pests, many state and federal publications, for distribution to the public, contain information wholly out of date and in some cases with incorrect statements. Furthermore, there is a wide diversity of recommendations in different publications. Therefore, it is suggested that those preparing such publications make a more thorough comparison between laboratory findings and commercial experiences, to the end that more uniform recommendations be made.

It is also believed that such publications should recognize the services of pest control operators as has been done in some state and federal bulletins. This is especially important in the case of structural fumigation.

3. **Research.** We would like to repeat a statement made in our last report, to the effect that entomologists should become better acquainted with commercial operators, as well as familiarize themselves with the problems and needs of such operators, to the end that they may realize the vast field of applied entomology which has been greatly neglected and that they may make a greater effort to enlarge their investigations within the field of household pests.

The amounts of financial aid from the state and federal sources are wholly inadequate to carry on the much needed research in this phase of entomology and special efforts should be made to secure adequate funds. We recommend, therefore, that this association indorse the present program of the National Pest Control Association petitioning for greater federal funds and urges their assistance in cooperative endeavors that will make for further appropriations in the various states.

4. **Common Names.** We commend the initiative of the National Pest Control Association in submitting to its members a list of common names of household insects prepared by Dr. F. L. Campbell, which included the list approved by our association and the names used by various authors. This list and reactions by members of the industry will be published in the January, 1941, issue of PESTS Magazine and should be studied by members of our association. Furthermore, it is recommended that common names, especially those within the field of commercial pest control, being considered by our Committee on Common Names be submitted to members of the National Pest Control Association, for comments, in the eventual selection of common names of insects.

Respectfully submitted,

Avery S. Hoyt
W. P. Flint
J. J. Davis, Chairman.

(Representatives of the National Pest Control Association at the Joint Committee Meeting were William O. Buettner, P. Calvert Cissell, Martin Meyer, and A. F. Kavanaugh.)

Announcing

A New Bulb Market for You

Many householders do their own service work. Since you can't sell 100% of them service, you *can* sell them the "makings." Help yourself to a new source of easy profit by selling them a New Centrobulb Jr.—a 4-oz. bellows having all the features of the large professional Centrobulb.

1. Heaviest metal nozzle with deep cut thread.
2. Largest opening for easy filling.
3. Stay tight screen to avoid clogging.

Write for our surprisingly low prices and start making these extra profits at once.

Central Rubber Products Co., Inc.
821 Broadway New York, N. Y.

BE PREPARED

Organize NOW for a Successful Termite Season

WITH

Chec Termite Control Chemical

No Stain — No Smell — No Arsenic

THE CHEC CO. v 5923 Julian Ave. v St. Louis, Mo.

FOR HIGH KILLING POWER

use

"RO-CHEX" PHOSPHOROUS PASTE

The Paste With the Odor That Lures

TRIAL ORDER, 1 Lb.....$0.45

RO-CHEX MAGNETIC SULPHUR DUST OR SPRAY
(CONTAINS ROTENONE)
For Garden and Agriculture Use

PRICE, 1 Lb.....$0.45

GREENPOINT CHEMICAL CO.
981 Myrtle Avenue Brooklyn, N. Y.

LOCAL ORGANIZATION NEWS

New York Pest Control Association

Regular meeting of the New York Pest Control Association was held at its headquarters, 366 Madison Avenue, New York City, on Tuesday, January 21. President Bill Buettner presided. The guest speakers of the evening were L. L. Lehritter of the American Cyanamid & Chemical Corp., who discussed interesting incidents with regard to fumigations, and who conducted a "Question and Answer" period, so as to give assistance in connection with unusual problems.

Those in attendance were fortunate to hear George B. Lay and Ernest Mills, Predator and Rodent Control Division of the Fish and Wildlife Service of the U. S. Department of Interior, who gave many helpful suggestions as to cooperative endeavors that might be pursued by the pest control industry in regard to rat problems.

Greater Kansas City P.C.O.'s

The P.C.O. Association of Greater Kansas City held its regular monthly meeting December 30 at the Pickwick Hotel.

A general discussion on termites took place and it was agreed to consider the policy recommended by the National Association at the next meeting.

The matter of Fumigation Practices recommended by the National Association was voted upon and adopted.

A general discussion on fumigation also took place and it was decided to discuss this further at the next meeting.

The following members were present: Frank Gates, Phil Burnett, F. Andrews, N. Pulley, Chas. Bedingfield, R. Shuyler and Al Cossetta.

Northwest Pest Control Association

The Northwest Pest Control Association met January 21, 1941, for one of their usual interesting meetings. The meeting was addressed by Sam J. Levy on the subject, "Wage and Hour Law." Officers also were elected and the new officers are: H. V. Smith, St. Paul, President; R. A. Myers, St. Paul, Vice-President; Max J. Levy, Minneapolis, Treasurer; and G. T. Athelstan, Minneapolis, Secretary.

California Pest Control Association, Inc.

We can think of no better way to inform the pest control industry as a whole about the activities of the California Pest Control Association than to reprint verbatim the following pertinent paragraphs lifted from the California Pest Control Monthly.

Annual State Association Meeting: The Annual State Association Meeting is to be a one-day business session, and will take place in San Francisco on Wednesday, February 19, 1941. The Whitcomb Hotel has been selected by Ernie Mills and his committee as convention headquarters. President Jess Miller will start the ball rolling at 9:00 A.M. by calling the boys together to discuss important past, present, and future activities that are of vital issue to every P.C.O. on the West Coast. All members of the California Pest Control Association should make a special effort to be on hand for the opening session.

Under the most able leadership of Jess Miller, the state association is about to complete the most successful year in the organization's existence. At the coming meeting the association will celebrate its 7th birthday as a state-wide organization made up of the most progressive pest control operators in California. Jess' annual report will show a very substantial increase in membership during the past year. It will also include a number of other worthy achievements that have been attained since the members met in Hollywood last January.

Pest Control Operators' Conference: "Keep Abreast of the Best and Ahead of the Rest," was the slogan that was first adopted in 1939 by the Pacific Coast Pest Control Operators' Conference. We are still of the opinion that there can be no better slogan because those few words present a mighty picture. It tells at a glance the true story of the real reason for holding these annual get-togethers on the Berkeley campus of the University of California. There is absolutely no other place where the pest control operator on the West Coast can get what is required to keep himself uptodate and therefore, successful in building up his business of pest control. It is at these conferences where the learned men of pest control meet with those who are, in many instances, less learned on certain subjects which demand greater knowledge for advancement in the pest control field.

The 4th Annual Pacific Coast Pest Control Operators' Conference commences at 9:00 A.M. on Thursday, February 20th, and lasts for three days.

Pest Control Film: H. J. Davies reports that steady progress is being made on the production of the Association's Pest Control Film, and that in addition to the termites, rats, and roaches which have already been filmed and previewed, such friendly customers as moths and bedbugs have been included. There is no question but that the film will be completed in time for showing at the national convention in San Francisco.

Districts of State Association to Entertain National President: The seven districts of the California Pest Control Association, Inc., have planned local district meetings and entertainment in honor of their beloved member, Mr. L. R. (Dad) Alderman, who was recently elected President of the National Pest Control Association, Inc. San Diego held the first meeting in Dad's honor, December 1, 1940, at the Grant Hotel. Many friends and operators of the industry were present and participated in the program and entertainment. The following meetings are scheduled for the month of January: Santa Barbara, January 11, 1941; San Francisco, Berkeley, Oakland, January 15, 1941; Los Angeles and surrounding territory, January 17, 1941.

Los Angeles District Elects New Officers: Mr. A. L. Forde, of the Rose Exterminator Company of Los Angeles and Santa Monica, was elected Chairman of District 2; Mr. D. C. Tracy, of the Golden State Termite Control of Los Angeles, Vice-President; Mr. J. E. McNatt, of the Foss Construction Company of Pasadena, was reelected Secretary-Treasurer. A special meeting to discuss legislation was held on January 3, 1941.

Ladies Auxiliary: Due to the shortness of the office period of the 1940 officers, the same were reelected for the year 1941. They are, Mrs. L. R. Alderman, of Pasadena, President; Mrs. L. W. Williams, of

Estab. 1851
For Better Application of Your Insecticides Use
Houchin's Insect Powder Blowers
—WRITE FOR CATALOG—
Thos. W. Houchin Corp.
87 Ferry Street
Jersey City, N. J.
MEMBER NATIONAL PEST CONTROL ASSOCIATION

Special This Month
10% discount on all orders
FOR
THALLIUM IMPREGNATED CANARY SEED
FOR MICE CONTROL
BIRD REPELLENT
Keeps buildings free from roosting birds.
PEST CONTROL CHEMICALS CO.
P. O. Box 37 Write for Details BUFFALO, N. Y.
BUFFALO, NEW YORK

Wilmington, Vice-President; Mrs. A. L. Forde, of Santa Monica, Secretary-Treasurer. "Lady Bug" pins are under consideration as auxiliary emblems.

Joint Meeting Districts 6-7: A joint meeting of Districts 6 and 7 was held December 12, 1940, at the Koffee Kup, 5424 Geary Street, San Francisco, with thirteen members present. A joint meeting of these two districts, to which the ladies were invited, was held at the Durant Hotel in Berkeley, January 15, 1941. This meeting was primarily in honor of "Dad" Alderman, the new President of the National Association, and also to help prepare for the conference in February, and also the annual association convention, and the national convention, both of which will be held in San Francisco. Prof. Herms and Dr. MacLoed outlined the coming conference program—and what a conference! No operator should miss it.

Regarding the question of commercial displays at the conference, Mr. Montgomery reported that in view of the national convention in October, no displays should be made at the conference for this year at least, but that efforts should be concentrated on getting together a first-class display at the national meeting.

Following adjournment of the joint meeting, District 7 held a business meeting at which the election of officers for the coming year was held. Mr. H. J. Davies was elected President; Mr. John F. Leinen, Vice-President; Mr. Martin, Secretary; and Mr. G. W. Peterson was reelected Treasurer. District 6 elected R. V. Haneberg, President; L. R. Juday, Vice-President and Treasurer; and Arthur Eddy as Secretary.

The Associated Pest Control Operators of Los Angeles, California

At the December meeting of the Associated Pest Control Operators Inc. forty-five attended and President D. G. Rennie presided. The important business was that of election of officers.

President, D. G. Rennie; 1st Vice President, Chet W. Pencille; 2nd Vice President, Don Eason; Secretary, Geo. S. Foote; Treasurer, Cliff Hodel.

Directors: G. M. Culton, M. K. Darby, John Fobes, Bob Mescher, Ernie Harbor.

Membership Committee: Gus Dahlberg, Bill Farnsworth, G. M. Culton.

Constitution and By-Laws Committee: Harry Fobes, M. G. Jorgenson, L. K. Klinker.

Legislative Committee: Chet W. Pencille, Don Eason, Cliff Hodel, M. G. Jorgenson, W. M. Frazier, Hugh Smith, D. G. Rennie.

In connection with the legislative program, the Association in cooperation with the Bonded Termite Operators have employed T. Cunningham, an attorney, to assist in drafting legislation and representing the two Associations at the legislative session in Sacramento, Calfornia.

The January meeting took place at the usual headquarters at Eaton's Chicken House on January 8 but no work has been received as yet.

DR. E. C. ELLIOTT, PRESIDENT PURDUE UNIVERSITY, DEFINES AN "ECONOMIST"

"An economist," he related over the air waves at a recent Chicago Round Table Conference, "is one who tells you what to do with your money after you have done something else with it."

WHAT'S NEW IN PEST CONTROL-PERSONALS

IN MEMORIAM

December 7, 1940, John W. Pencille, founder of the Guarantee Fumigating and Exterminating Co. in 1908, passed away at the age of 67. He is survived in business by our First Vice President, Chet W. Pencille, who will carry on. Mr. Pencille was one of the first to enter the fumigation business in Los Angeles, and his passing is a loss to the industry.

The Fort Wayne Exterminating Engineers have purchased the entire stock, accounts, and material of the Indiana Pest Control Service Company, owned and operated by E. A. March. This became effective January 1, 1941.

George E. Sanders, of Sanders Exterminating Co., New York, had a ten-day siege recently at home with the much prevalent influenza. When ye correspondent saw George on his return to the office, it was only too evident that he was not over it by any means, but try and tie an up and coming pest control operator to his bed when there is work to be done. Best wishes for a speedy, complete recovery, George.

In these troublesome times, it is always refreshing to hear from Barney and Bill Houghton of Houghton & Byrne of Sydney, Australia. This firm, as an active member of the National Pest Control Association, never forgets to send greetings to their many friends in America, and we in return heartily reciprocate.

The Memphis, Tennessee, Sales Managers' Club recently presented distinguished sales awards to "Star" salesmen. Among the winners was Charles Treadway of the Orkin Exterminating Company of Jackson, Mississippi. The award was based on a contest on net business gained in competition with the Orkin Company offices at Little Rock, Memphis, Paducah, and Jackson.

Among those in attendance at the annual meeting of the American Association of Economic Entomologists held at Philadelphia, Pennsylvania, during the Christmas-New Year holidays were P. Calvert Cissel of Washington, Martin Meyer of Philadelphia, Captain John Vogel of Philadelphia, A. S. Cavanaugh of Philadelphia, and Bill Buettner of Brooklyn. There was held a joint committee meeting of representatives of the American Association of Economic Entomologists, represented by Prof. J. J. Davis, Prof. W. P. Flint, and Mr. Avery Hoyt, and the above-mentioned representatives of the National Pest Control Association. The joint committee report was acted upon by the American Association of Economic Entomologists, and appears elsewhere in this issue of "Pests".

W. H. McCain and his son Warren, of Dayton, Ohio, of the Extermital Laboratories, were recent visitors to New York City.

Was the insect identification contest at the Purdue Conference on the "up and up"? The Rose twins (Bob Yeager and Harlem Ives) each scored 88. The Boss (Norman Dold) scored 84.

Russell G. Clark, Jr., son of Mr. and Mrs. Russell G. Clark of the Chicago Exterminating Company, is a freshman at Purdue, majoring in Entomology.

W. E. McCauley accompanied Bill Buettner back to New York following the Purdue Conference. From there he went to Amherst to participate in the Eastern Conference at Massachusetts State College.

Prof. and Mrs. J. J. Davis attended the First Eastern Conference of Pest Control Operators held at Massachusetts State College January 13-15. Professor Davis took part in the meetings and was toastmaster at the Conference banquet.

W. E. McCauley of the University of Illinois, J. J. Davis of Purdue University, and George B. Lay of the Federal Fish and Wildlife Service were guests at a lobster dinner at the Lobster House, Charlestown, Massachusetts, Thursday evening following the Eastern Conference. Pest control operators attending included Charley Houghton, Bart Eldredge, Lewis A. Rich, George Elliott, and Louis Weintraub.

Business Opportunities

(Classified)

ONE OF MIDWEST'S most efficient P. C. Operators desires connection with a California firm. Also an estimator with a pleasing personality. Absolutely no user of liquor. Can furnish best of reference. Twelve years experience. Employed at present. Write B-8, care PESTS.

WRITE FOR THESE BOOKLETS

Please note, however, that you must request each booklet on a separate letterhead though they must all be mailed in one envelope addressed to Pests, 126 Lexington Avenue, New York City, N. Y.

PARADICHLOROBENZENE PRODUCTS

Circular describing bowl deodorant with aluminum wire hanger; bowl deodorant with wire hanger; moth vaporizer; microphone moth vaporizer; moth vapor bomb; vaporizer refill; paradichlor nuggets or crystals, etc. Write Greenpoint, c/o PESTS.

PYRETHRUM EXTRACT No. 20

Circular discusses pyrethrin content, kill and knockdown value, odor, color, clarity, stability, price and other concentrates for liquid insecticides.

WRITE PESTS—Dodge.

Announcing...

KARPEX

For the Control of CARPET BEETLES

KARPEX has been created exclusivey for the control of carpet beetles and is an insecticide for sprayng only. It comes in concentrated form, to be diluted 4% in insecticide base oil. While KARPEX is officially new, it has been used for field tests by discriminating Pest Control Operators for the past two years. KARPEX fills a need long desired in the Pest Control Industry. KARPEX in its finished form will not spot or stain, is non-injurious to workers, and is non-poisonous to human beings and animals. KARPEX contains 100% active ingredients.

KARPEX W

For the Protection against **CARPET BEETLE LARVAE**

KARPEX W is the protection against damage done by carpet beetle larvae. It is an aqueous product, super-concentrated, and can be diluted in the proportions of 4% in ordinary city water. It contains all of the penetrants desired for a thorough job.

KARPEX and **KARPEX W** are priced right. We shall be glad to send you further information and working samples upon request.

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